Why monitoring doesn't always matter:

The situational role of parental monitoring in adolescent crime

BETH HARDIE

CHURCHILL COLLEGE

UNIVERSITY OF CAMBRIDGE

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Preface

This thesis is the result of my own work.

It includes nothing which is the outcome of work done in collaboration although it uses data from the Peterborough Adolescent and Young Adult Development Study (PADS+). I joined the PADS+ research team in 2004, since when I have contributed to sample retention, the development of data collection instruments, the collection of raw data and creation of measures, empirical analyses and research publications and other outputs. My individual contribution to theory and analysis presented in this thesis builds on this team endeavour.

It is not substantially the same as any that I have submitted, or, is being concurrently submitted for a degree or diploma or other qualification at the University of Cambridge or any other University or similar institution. I further state that no substantial part of my dissertation has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution.

This thesis does not exceed the word limit (extension granted).

Acknowledgements

"We are not students of some subject matter but students of problems"
(Popper, 1963, p. 88)

This thesis has been a long time coming. It reflects the learning, knowledge and skills I have accumulated, particularly over the past 12 years while working on PADS+ at the Institute of Criminology, University of Cambridge.

Thanks go to P-O Wikström for teaching me the joys of always asking 'why?' and helping me to find a niche for my perfectionism. I was fresh out of my undergraduate degree when I met him and he has been heavily influential in the (continuing) development of my world view and critical thinking. Thanks to my colleagues and collaborators for specific support for my thesis and for everything along the way, particularly Kyle Treiber, Caroline Moul, Neema Trivedi-Bateman, Jenni Barton-Crosby, Dietrich Oberwittler, Helmut Hirtenlehner, Gabriela Roman, and Harald Beier. I have been lucky to have worked with you all. Thank you also to the Institute of Criminology PhD Writing Group, my early reviewers Katrin Mueller-Johnson and Michael Rice, and particularly my examiners Clemens Kroneberg and Marie Torstensson Levander (chaired by Tony Bottoms). I am grateful to the University of Cambridge Domestic Research Scholarship and Churchill College for their financial support of me personally, and to the UK Economic and Social Research Council which funded PADS+ during the period of data collection relevant for this study. Thank you finally to my amazing friends and family, Andy in particular, who all supported me throughout this process. I hope this makes you as proud of me as I always am of you all.

I dedicate this thesis to some of the women in my family: Nanna, Aunties Dorothy and Kay, and Mum. You taught me to work hard, be the best I can be, and be curious. I hope I can nurture this in others as you did for me.

Beth Hardie

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Summary

Parental monitoring of settings is not always relevant for the prevention of adolescent crime because adolescents with strong personal moral rules and the ability to exercise self control are unlikely to offend even when they are unsupervised and know that their parents have little knowledge about their activities.

Parental monitoring, commonly operationalised as parental supervision or parental knowledge, is often shown to have a negative relationship with crime involvement. However, research often ignores both the mechanism by which these relationships occur and the conditions under which they might (and might not) be found. This thesis uses specialist Space-Time Budget data (from the Peterborough Adolescent and Young Adult Development Study) to allow the comparison of adolescent crime rates in settings characterised by the of convergence of i) the physical presence or absence of parents and other guardians, ii) the psychological presence or absence of parents (represented by adolescent-perceived generalised parental knowledge of the circumstances of unsupervised activity) and iii) personal crime propensity (moral rules and ability to exercise self control). The conclusion derived from the results is that the physical presence of parents and other guardians in settings reduces the rate of adolescent crime committed in those settings; and the psychological presence of parents reduces the criminogenic impact of unsupervised time. Crucially however, these effects of parental monitoring are almost irrelevant for adolescents with a lower personal crime propensity, who are not likely to offend in settings irrespective of the physical or psychological absence of parents and other guardians. These findings provide support for person-environment interactions inherent in the causal model of Situational Action Theory, and provide a novel addition to evidence that could be used in future to inform policy-relevant recommendations concerning parenting behaviour and adolescent offending.

Although this thesis provides new evidence about the relationship between parental monitoring and crime, the bulk of its contribution is relevant to a much wider audience. It contributes to the debate on approaches to the study of crime and crime prevention, adds clarity to key concepts and develops theoretical arguments in the field of parental monitoring and crime, develops a novel application of Situational Action Theory, extends theoretical and methodological discussions surrounding situational analysis, applies novel data and analytical methods to the study of the psychological and physical presence of guardians, generates and situates unique findings about the situational role of aspects of parental monitoring and crime, and makes some policy recommendations and suggestions about the nature and direction of future research.

Synopsis

This thesis provides new evidence about the relationship between parental monitoring and crime, though the bulk of its contribution is towards a much broader goal. It makes important arguments about how we approach every aspect of the research process involved in addressing the question it sets out to answer; making its contributions relevant to a wide audience.

Adolescent crime is a serious problem and there is much incentive to reduce crime. Prediction-based approaches may have some crime prevention successes but *explaining* the causes of crime by young people is a crucial part of informing effective crime prevention policy and practice. The important questions for prevention are *how* and *why* crime happens and these are best answered within the framework of a coordinated theory. Situational Action Theory (SAT) specifies a model of action that integrates individual and environmental levels of explanation. This framework allows for the specification (and therefore empirical testing) of plausible causal mechanisms that link particular factors and crime.

The topic of this thesis is the role of parental monitoring in adolescent crime. Adolescence is a crucial period of change and transition, and parents and parenting are fundamental to processes that influence behavioural and developmental outcomes during this period. In particular, poor parental monitoring is strongly related to crime and is often posited as a key cause of adolescent crime. One of the barriers to researching the mechanisms that link parental monitoring and crime is a lack of clarity about the concept of parental monitoring itself. A nascent model of parenting allows a clear conception of parental monitoring to emerge and, crucially, the distinction of parental monitoring from supervision and knowledge which are commonly used to operationalise it. The study of the relationship between these variables and crime can, as a result, be more effectively theorised and empirically explored.[1]

The framework of SAT provides a number of mechanisms and processes by which the presence of parents (and their proxies) and parental knowledge can influence crime. Application of the SAT framework organises the chaotic literature on parental monitoring and crime, and although there are some useful concepts and evidence, it is apparent that a model of action and integration of levels of explanation are generally lacking. This thesis focuses on exploring situational processes and specifies empirically testable hypotheses about the situational role of the presence of guardians and adolescent-perceived parental knowledge in adolescent acts of crime.

[1] Active parental monitoring behaviours and other related factors may also be relevant to processes that lead to offending, but knowledge and supervision are the focus of this thesis due to a continued lack of clarity about the nature of their role in acts of crime, despite their dominance in the parental monitoring and crime literature.

The person-environment interaction inherent in the situational process that leads to crime and the data and analytical methods required to study it are frustratingly misunderstood. Only situational data that captures individuals in environments can truly evidence the interactive nature of the situational action process. The PADS+ study provides such unusual data.

Initial traditional empirical analyses of individual level data produce findings that are in line with expectations derived from the proposed situational mechanisms; however, these can only evidence a statistical dependency and not situational interaction. Situational analysis of situational data confirm that acts of crime are most likely under convergent conditions of high crime propensity, absence of guardians and perceived poor parental knowledge.

A specific contribution of this thesis is the theoretical development and empirical testing of the role of psychological presence of parents in contexts (alongside and independent of the physical presence of guardians) in the situational process leading to acts of crime.

This thesis has implications for crime prevention policy and interventions, for the methods and direction of future research, and for generally how we as a society deal with parents, adolescents and crime.

Roadmap: Content and contribution

The research question underpinning this thesis asks how parental monitoring plays a role in the situational process of adolescent-environment interaction that leads to acts of crime. This thesis is divided into five parts which are structured around i) approach, ii) explanation, iii) method, iv) analysis, and v) implications. Each makes a contribution to the study of crime and crime prevention, parental monitoring or situational processes.

Part I: Approach: Making criminology relevant

The first part of the thesis is concerned with the problem of crime, the approach to crime prevention, the theoretical framework within which this thesis addresses its research question, and justification of the research topic.

Why study the causes of crime? Chapter 1 initially provides a broad rationale for the study by evidencing the problem of crime and crime by adolescents in particular; stating that informing effective crime prevention policy and practice should be the ultimate end goal of criminological research such as this thesis. This is a pragmatic approach to research, as opposed to 'knowledge for knowledge's sake'. Chapter 1 then describes the overarching approach taken by this thesis to the problem of crime prevention. The chapter provides additional detail to and further justification of the existing argument for theory-driven empirical study of the causes and mechanisms that lead to crime, by further describing and evidencing how existing alternative approaches are at best inefficient and at worst actually harmful in their crime reduction and prevention efforts. This argument adds to the growing impetus towards an analytical approach to the problem of crime prevention.

What kind of theory best frames an analytical approach? Situational Action Theory (SAT) is a suitable guiding theoretical framework for this thesis because it addresses key but often neglected problems in criminology. Chapter 2 outlines the main propositions of SAT and provides some key concepts and definitions. By describing the historical context of theory and research, further clarifying and evidencing important distinctions, and providing examples of and solutions to common misconceptions; the particular contribution of this chapter is the development of existing SAT-led discussions about the interactive nature of the integration of individual and environmental explanations of crime. This interaction is fundamental to SAT's conception of the situational mechanism that leads to action (including acts of crime).

Are parents to blame? The family and parents in particular, are regularly burdened with the blame for the crimes of their children, but how have parents of offenders failed? Chapter 3

narrows the focus of this thesis to the role of parental monitoring in adolescent crime. Whilst parents might not be fully to blame, this chapter outlines the potential importance of parents and parental monitoring for adolescent crime prevention. Chapter 3 contributes a new way of theorising parenting to highlight how parents can influence processes of development and action through their influence over the content of and exposure to contexts of development and action. This provides some guidance as to how SAT can be applied to the study of parenting.

Part II: Explanation: Prioritising interaction, specifying what and asking how

Part II develops the theoretical framework for the later empirical study of the research question.

What is parental monitoring? What is it not? Chapter 4 gets to the heart of the research topic by defining parental monitoring. A new model of goal-directed parental action defines parental goals, parenting behaviours and parental monitoring, and the relationships between these concepts. This gives a more precise, better specified and properly integrated version of any previous definitions of these concepts. It also explicitly distinguishes supervision, presence of guardians and parental knowledge by both developing and criticising the existing parental monitoring literature. This strong basis facilitates improved operationalisation of concepts and specification of statistical models and other analytical procedures designed to test theoretically-driven hypotheses in the methodological and empirical chapters that follow.

What can parents do? Chapter 5 discusses the processes and mechanisms that link parental monitoring and crime. Application of the SAT framework organises the disjointed, fragmented and unproductive existing literature on parental monitoring and crime and in so doing exposes its limited explanatory ability. Most literature on parental monitoring and crime is underpinned by a preoccupation with prediction and description rather than explanation. Furthermore, most of these conceptualisations either conflate developmental and situational processes, or focus on either individual or environmental processes. Any useful concepts and evidence from the existing literature are integrated into a novel development of SAT that specifies the ways in which the presence of parents and other guardians and parental knowledge can impact social and situational processes that lead to action.

What can parents do in situations? Chapter 6 goes on to develop SAT's situational model in order to specifically theorise the situational role of aspects of parental monitoring in young people's crime causation. This includes the development of some novel ways of thinking about the role of parental knowledge and presence of guardians in young people's behaviour. These insights culminate in a series of hypotheses that are suitable for empirical testing. Due to a strong

theoretical framework and improved conceptualisation, these hypotheses are more meticulously specified than in any research in the field of parental monitoring and crime. They specify i) the basic relationships between key variables and crime, ii) the nature of the integration of features of individuals and environmental conditions, iii) the exact (conditional) role of parental presence and parental knowledge, and iv) the particular nature of the convergence of factors that is hypothesised to result in the highest and lowest rates of crime.

Part III: Method: Capturing and analysing situations

Part III details the analytical and data collection methods of this study.

How can we analyse person-environment interaction? Chapter 7 deals with the analytical approach, considering both situational analysis and methods for demonstrating statistical interaction. This chapter first outlines approaches to and definitions of interaction, which includes a brief summary of the statistical methods routinely used to assess interaction. In more detail than existing treatments of this topic (at least in criminology), this chapter deals with the problems and pitfalls of evidencing person-environment interaction in the action process; there are limits to using non-situational data for evidencing interaction, the distinction between situational level and individual level data is rarely acknowledged, and some criminological studies and approaches that self-define as 'situational' should be reclassified. Chapter 7 also presents the benefits of the unique properties of situational data and describes the specifics of the analytical techniques used in this thesis.

How can we capture person-environment interaction? Chapter 8 describes and discusses the data collection methods, instruments, measures and data used in the study. This chapter makes novel contributions by discussing the operationalisation of the presence of guardians concept (i.e., what is 'presence' and who is a 'guardian'), evaluating the concept of adolescent perceived parental knowledge and its accuracy, specifying the capture of moral contexts, detailing the process of transformation between different levels of data and how different measures at different levels fit together for analysis, and critiquing the relevance and importance of causal ordering considerations for this particular type of data and analysis.

Part IV: Analysis: Testing hypotheses

What are the findings? The empirical analyses and findings are laid out in Part IV, with some initial discussion of results. It puts the theory outlined in Part II to the test using the data and analytical approach described in Part III to attempt to address the research problem stated in

Part I, by providing knowledge about the situational role of the presence of guardians and parental knowledge in the causes of adolescent crime.

Chapter 9 first presents basic interrelationships and then provides multi-method analysis of interdependency in traditional (individual level) data. Despite the methodological difficulties inherent in assessing interaction effects, there is evidence of a three-way statistical interaction in the data. Although this represents the first exploration of the situational role of perceived parental knowledge in crime, due to the individual level structure of the data used in these traditional analyses this finding can only evidence a dependency effect and does not represent person-environment (situational) interaction.

Chapter 10 displays and statistically compares rates of crime that result from a range of convergent conditions to assess the data for evidence of situational interaction. This kind of analysis of this kind of data is extremely rare and has never before been conducted to specifically assess parental monitoring and crime. The findings evidence situational interaction in line with proposed hypotheses, specifically showing that *acts of crime are most likely under convergent conditions of high crime propensity, absence of guardians and perceived poor parental knowledge.*

Part V: Implications: What next?

Part V (Chapter 11) summarises the contribution to knowledge and discusses the varied implications for theory, method and crime prevention.

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PART I: APPROACH:

Making criminology relevant

1 The problem of crime

This first chapter lays the groundwork for the entire approach of this thesis. The ultimate end goal of criminological research should be to inform effective crime prevention policy and practice. This is because crime is a major problem for our society (section 1.1:). This pragmatic approach to research is underpinned by a fundamental belief that to effectively reduce crime we must understand its causes, and that this requires an analytical approach (section 1.2:). Whilst alternative approaches to criminological research can 'make do' in the absence of knowledge about the causes of crime, they are not only less effective and less efficient, but the risk of actual harm makes them reckless and potentially dangerous. This means that research must continue to strive to explain crime and not settle with 'making do'.

Too often research is undertaken for its own sake, with no regard for an end goal that justifies it. In addition, the nature of the overarching approach to research has implications for all stages of the research process which means that good quality research must consider and justify its approach. For these reasons, detailed description of and evidenced justification for the overarching approach of this thesis is the crucial starting point of this thesis.

1.1: Crime

UK public opinion polls show that the problem of crime is consistently at or near the top of the list of the most important issues facing Britain (see e.g., Ipsos Mori Issues Index: Trends since 1997). The British Crime Survey shows a high level of fear of crime, and many residents report that crime is a big problem at a local level (Chaplin, Flatley, & Smith, 2011; Home Office, 2012).

This public fear of crime and feeling about the seriousness of the crime problem is reflected in political priorities and in the media. Crime has played a key role in election manifestos and political debates in recent times (e.g., Morgan & Hough, 2007). Across all media, stories about crime and the criminal justice system account for a substantial proportion of news coverage, and fictional and non-fictional crime is also the subject matter of many documentaries, blogs, editorials, films, books, and websites (for an overview, see, Greer & Reiner, 2012, pp. 248-256). It may also be the case that media and political attention to crime, including sensationalist coverage, contributes to a distorted (inflated) perception of crime amongst the public (see, e.g., Chaplin et al., 2011; Greer & Reiner, 2012; Pfeiffer, Windzio, & Kleimann, 2005; Roberts, 1992; Uribe & Gunter, 2007). There is also explicit awareness amongst the UK public that

sensationalist media reporting of crime generates suspicion of adolescents among others (Jacobson & Kirby, 2012).

Regardless of any over-inflation of the *perception* of the crime problem, the social and economic impact of crime is considerable.[1] The UK National Statistician acknowledges that crime is an inherently difficult phenomenon to measure resulting in widely varying figures depending on the method of measurement (Matheson, 2011). However, whichever statistics we use tell us that despite long term decreasing and now flattening trends for almost all crime types, the impact of crime is still huge: More than a fifth of adults surveyed by the British Crime Survey reported being a victim of crime in 2010/11 (Chaplin et al., 2011) and BCS data suggests that as many as 9.6 million offences occurred in England and Wales in the single year 2010/11 while police recorded 4.2 million offences during the same period (Chaplin et al., 2011).

Crime is economically costly.[2] Most tangible are the direct financial costs of crime to government, businesses and individuals, which include lost productivity and out-of-pocket expenditures such as lost possessions. Placing monetary value on the financial and particularly the social 'cost-of-crime' is inherently difficult (for a discussion, see, Atkinson et al., 2005; Welsh, Farrington, & Raffan Gowar, 2015). As a result, 'cost-of-crime' estimates vary dramatically, for example, ranging from £36-£124 billion annually depending on the criteria used and the age of the data (e.g., Dubourg et al., 2005; Home Office, 1999; Institute for Economics and Peace, 2013). Regardless of the actual amount, these 'cost-of-crime' estimates all signify a significant impact on the UK economy (representing between 2-5% of Gross Domestic Product).[3]

Crime also has high social costs, which are much more intangible. Crime 'makes local people feel anxious and uncomfortable', and youth crime 'causes disruption to their day-to-day lives' (Jacobson & Kirby, 2012). Violent crime is recognised as a major health concern (World Health Organisation, 1997) and arguably incurs the greatest social cost of any crime type (see Chaplin et al., 2011 for data on numbers and seriousness of injuries caused by crime).[4] Atkinson et al. (2005) estimated that a single violent crime carried a monetarised social cost of £5,300 to £36,000

[1] Fear of crime itself actually has negative impacts, which often carry a financial as well as social cost (Atkinson, Healey, & Mourato, 2005; Dolan, Loomes, Peasgood, & Tsuchiya, 2005; Dolan & Peasgood, 2007; Dubourg, Hamed, & Thorns, 2005; Moore & Shepherd, 2006).

[2] In addition to the social and financial costs of crime to victims and wider society, there are also social and financial impacts of crime on the offender. Whilst there may be benefits of offending, most offenders experience some negative impact and many experience very serious impact such as incarceration and other punishments, and indirect impact such as family breakdown, school drop-out, and drug addiction. These social and financial costs of crime to offenders (of whom there are many), if not addressed, will ultimately cost society further in the long term.

[3] Calculated using annual World Bank UK GDP figures.

[4] See also Hospital Episode Statistics online; www.hscic.gov.uk/hes (accessed 30th October 2014).

depending on the seriousness of any injury.[5] Social costs may even represent as much as half the total financial cost of crime (Dubourg et al., 2005).

Studies of a different type conducted in the United States also highlight the vast financial implications for prevention. For example, the monetary value of saving just one high-risk youth from a life of crime was estimated at between $2.1-$4.4 million (M. A. Cohen & Piquero, 2009; M. A. Cohen, Piquero, & Jennings, 2010).[6]

1.1.1: Adolescent crime

Adolescence is a particularly crucial period for the development and occurrence of offending. 'Age-crime curves' are familiar to all criminologists because they commonly and consistently show that the officially recorded offender rate for adolescents is very high, yet drops off very quickly throughout early adulthood to a much lower rate in older people (Bottoms, Shapland, Costello, Holmes, & Muir, 2004; Piquero, Farrington, & Blumstein, 2007; Wikström, Oberwittler, Treiber, & Hardie, 2012). Studies from across Europe and North America show low crime involvement throughout childhood into early adolescence, rising very swiftly to a peak in mid to late adolescence and tailing off into adulthood (e.g., Farrington & Wikström, 1994; Junger-Tas, Terlouw, & Klein, 1994; Laub & Sampson, 2003; Le Blanc & Fréchette, 1989; McVie, 2005; Piquero et al., 2007; Tracy, Wolfgang, & Figlio, 1990; Wikström, 1990; Wikström, Treiber, & Roman, Forthcoming; Wilson, 1980).[7] Amongst these studies, the age at the peak prevalence for offending ranges from 14-17. This peak age seems in part to be determined by the kinds of data analysed because the offending prevalence peak recorded by self report studies is usually somewhat earlier than those using official data (see further, Wikström, Oberwittler, et al., 2012).[8]

Young people are responsible for a lot of crime and commit more offences than older people. For example, in England and Wales in 2007, 17 year olds committed 6 times the number of offences per 100,000 population than 60 year olds.[9] Therefore, it follows that a large proportion of officially recorded crimes are committed by young people: annually in England and Wales, offenders of at least a fifth of all recorded crimes (where an offender is cautioned or convicted)

[5] These various forms of 'cost-of-crime' estimates are roughly in line with similar estimates from the United States (Heaton, 2010).
[6] An earlier study proposed that the worst individual offenders impose costs as high as $36 million on the United States (M. A. Cohen, 1998).
[7] See also Ellis, Beaver, & Wright (2009) for a list of studies from across the globe of the relationship between age and both officially recorded and self-reported offending.
[8] The variation in the peak of the age-crime curve by the source of the data used to compile it has long been recognised in criminology (e.g., Reckless, 1940)
[9] Data source: Justice Statistics Analytical Services, Ministry of Justice.

are aged between 10 and 17 (Budd, Sharp, & Mayhew, 2005). This concentration of crime amongst young people is all the more striking because they are a small group, for example, young people aged 10-17 were estimated to be responsible for 23% of all police recorded crime incidents in 2009/10 yet they only accounted for around a tenth of the population over age 10 (Cooper & Roe, 2012). Consequently, young people are also often found to be disproportionately represented in other measures related to crime. For example, young people aged 10-20 represented 16% of the population of England and Wales in 2006,[10] yet were responsible for two-fifths (39%) of arrests in 2005-6.[11]

This skew towards young people in crime and offending is even more apparent in self-reported data (see e.g., Budd et al., 2005; Roe & Ash, 2008). Wikström et al. (2012, p. 49) suggest that the under-reporting and lower clear-up rate of crimes most prevalent among young people (see Jansson, Robb, Higgins, & Babb, 2008; Osborne, 2010; Parfrement-Hopkins, 2011) helps to explain why youth crime seems to be 'particularly absent' from official statistics. Recent youth crime policy that seeks to divert young people away from the criminal justice system also points to under-representation of younger people in official crime data (Cooper & Roe, 2012).

1.1.2: Summary

Crime matters. Crime is one of the biggest social problems to affect the welfare of citizens and society, and has a huge negative effect on the economy. Crime is of major concern to the public and politicians and is often the focus of media attention. The obvious implication is that by preventing crime we can reduce the social and economic burden on society. Therefore the prevention and reduction of crime is and should be a key aim of government and society.

Adolescence is a particularly important period for the development and occurrence of offending: young people commit a large proportion of all crime and therefore crimes by young people cost society and the economy a great deal. Therefore, preventing crime by young people is especially efficacious in reducing overall crime.

[10] Data source: Office for National Statistics mid-year population estimates (2006).
[11] Data source: Home Office.

1.2: Crime prevention: The challenge for criminology

> *"Not only are there many different and conflicting ideas about why people commit crime, but also about the best policies and interventions to tackle the problem of crime. There is also no shared definition of crime prevention. The dominance of risk-focused prevention in crime prevention policy has not helped counter its fragmentation. Arguably, there is a need for policy and prevention to move away from a risk-factor approach (targeting predictors that often lack causal efficacy) towards an approach that tackles the key causal processes that lead to crime."*
>
> (Wikström, 2017, pp. 516-517)

> *"It is clear that a workable formula for crime prevention has not been discovered…. Prevention needs to stop the sources of criminal behaviour, i.e., to prevent persons from becoming delinquent and criminal who otherwise would become so. But the etiological sources of criminal behaviour are not definitely known. Because of the lack of positive knowledge about the causes of crime, it is impossible to posit preventative measures on demonstrable facts of the roots of crime"*
>
> (Reckless, 1940, p. 422)

> *"All of the sciences are known to have advanced from description to explanation… Likewise, technology – from engineering to social policy making – advances from trial and error to design based on research. And in technology, as well as in basic science, to explain a fact is to exhibit the mechanism(s) that makes the system in question tick"*
>
> (Bunge, 2004, p. 182)

Despite the importance of crime prevention to society, the approach is rarely agreed upon and many efforts are ineffectual. The roots of the discipline of criminology are in both pure and applied research, and in both lie its usefulness to the prevention challenge. This section explains the difference between questions of what works and how it works, and why both are important for effective crime prevention.[12] In so doing, this section also highlights the difference between prediction and causation. Ultimately, the discussion advocates taking an analytical approach, which aims to "not only simplify crime prevention science but also to make crime prevention practices more efficient and effective" (Wikström & Treiber, 2017, p. 76). This serves to justify and explain the theoretically grounded approach to investigating the role of parental monitoring in adolescent offending that is taken in this thesis.

[12] Some policy seems to be devised without reference to research into either how or why it works, and unsurprisingly, it can spectacularly fail. The 'Troubled Families' initiative was set up in the wake of the 2011 London Riots to target a small number of particular families with the aim of impacting a broad range of key outcomes including crime and anti-social behaviours. Critics argue that the scheme was politically motivated and that the UK Government spent "hundreds of millions of pounds on an untested unpiloted programme on the basis of little or no evidence" (Portes, 2016). The senior civil servant director general of the scheme, whilst popular with politicians for being able to 'really cut through the bureaucracy and blarney', has a history of a flippant attitude to evidence-based policy (Wheeler, 2015). Ultimately, the initiative has recently been deemed a failure. An independent report by the National Institute of Economic and Social Research was "unable to find consistent evidence that the Troubled Families Programme had any significant or systematic impact"(Day et al., 2016). Not only was the initiative ineffectual, it was also very expensive.

The prevention of crime and of youth crime in particular is of great importance to the public, politicians and the economy; and those responsible for tackling it largely agree that crime reduction is a realistic goal.[13] For example, a stated assumption of the major reorganisation of the crime reduction infrastructure in the UK in 1997 was that crime reduction is possible (Pease, 2002). Actions that constitute crimes are infinitely diverse (Pease, 2002; Wikström, 2007a) and therefore the term 'crime prevention' covers a whole range of activities, techniques and initiatives (Hughes, 2013; Pease, 2002). These are devised and implemented by a large range of agencies. Therefore, a further assumption in 1997 was that crime reduction is best achieved through partnership between relevant agencies (Pease, 2002). However, whilst effective multi-agency partnership may facilitate effective crime prevention, it is in no way sufficient for it. Personal experience of working with local Crime Prevention Partnerships gives rise to the impression that too much attention is directed towards the coordination and organisation of crime prevention at the expense of the more fundamentally important *content* of crime prevention strategy[14] (see also, for example, Wikström, 2007a).

This lack of substantive content of crime prevention strategy surely results because professionals rarely agree on how best to approach crime prevention.[15] In the UK and elsewhere, the selection and attempted coordination of a number of initiatives into a crime prevention strategy seemingly uses ad-hoc methods, anecdotal evidence, ideology, subjective impressions, convenience, custom, assumption, rhetoric and arbitrary preference (Blomberg, Mestre, & Mann, 2013; Reiss, 1991; Sherman, Farrington, Welsh, & MacKenzie, 2002a, 2002b; Wikström, 2007a; Wilcox & Hirschfield, 2007).[16] As a result, the potential effect of a strategy for crime prevention is often unknown from the outset and prevention efforts are regularly short-term, rushed and poorly implemented; resulting in inconsistent and poorly coordinated action (Sherman et al., 2002b;

[13] Crime prevention is also commonly referred to as crime reduction, though these terms, for the most part (and for the purposes of this thesis), are interchangeable (see, Pease, 2002).

[14] For example, meetings with such partnerships often focus on the need for and nature of 'joined-up thinking', 'partnership working' and 'multi-agency partnership' for effective strategy and implementation. Representatives from all relevant agencies are in regular attendance, and care is taken to ensure all have a voice in such meetings. However, the same meetings are often devoid of discussion about the actual content of the strategy. Discussion of the detail of the causes of crime and the specifics of prevention measures to be implemented is often notably absent, or alarmingly anecdotal.

[15] This quote from 1940 suggests that this situation is not new: "Apparently, crime prevention is in the initial stages of development and no modern country has made any great headway with it. At presence it consists of a bundle of unchecked proposals, unverified claims, and trail-and-error experiments. The state of knowledge in criminology is advanced enough to separate the obvious chaff from the wheat in crime prevention programmes, but not advanced enough to command agreement among criminologists themselves, welfare workers, governmental leaders, and laymen on the most effective types of measures and points of application." (Reckless, 1940, p. 437).

[16] Of course, it is not necessarily straightforward to translate research findings into strategy. For a discussion of barriers to and facilitators of the use of evidence by policy makers, see Oliver, Innvar, Lorenc, Woodman and Thomas (2014). Sampson, Winship and Knight (2013) draw attention to the problem of translating causal claims into policy.

Wikström, 2007a; Wikström & Torstensson, 1999). In the light of this, it is unsurprising that there is a general professional feeling that efforts to reduce offending by adolescents are ineffective (for an empirical example of this from the USA, see, Farrington, Loeber, & Kalb, 2000). This is problematic because, aside from a requirement to be practicable, publicly and politically tolerable, and within an often scant budget; crime prevention initiatives and strategy must be at the very least, *effective*. So what can the field of criminology contribute to help meet the crime prevention challenge?

> *"The difficulty of knowing what to change, with an eye to reducing crime in the medium and long term, is immense"*
>
> (Pease, 2002, p. 949).

Furnishing crime prevention professionals with the evidence needed to flesh out the approach and substantive content of crime prevention strategy is the responsibility of criminology. Effective crime prevention must be informed, and here lies a key role for criminology. Around a century ago, the discipline of criminology found beginnings in the implicit basis that discovery of the causes of crime would guide subsequent policy and practice in order to prevent crime and facilitate rehabilitation (see, Blomberg et al., 2013). Despite a waxing and waning of the focus on its 'scientific stature' throughout the history of criminology, the discipline has, in recent years, begun to acknowledge again the importance of the application of research to policy (Blomberg et al., 2013; Sampson et al., 2013). The combination of pure and applied research represents a dual role for the discipline; first gathering knowledge about the causes of crime, and second using that knowledge to develop effective crime prevention policy and practice. Reiss, for example, recognised the importance of research and development as the 'core technology of crime prevention' and drew comparisons with other professions such as medicine to illustrate the need for a strong scientific evidence-base to underpin professional strategy (Reiss, 1991, 1995). More recently, Wilcox and Hirschfield (2007) made a similar case using a medical analogy by providing a detailed comparison (in which criminal justice fared worse) of the UK health and criminal justice fields in terms of the importance ascribed to evidence in the policy process.[17]

The initial formative intentions of discovering causes in order to guide policy and practice represent an ideal, however, that has never been realised for criminology (see, Blomberg et al., 2013). There is a tension that permeates the crime prevention challenge for criminology, which is

[17] Wilcox and Hirschfield's (2007) report drew attention towards, for example, the existence in healthcare but not criminal justice of organisations that aim to ensure that evidence of what works is translated in to public policy; the clarity or ambiguity with which the Department of Health and the Home Office respectively detail the role of evidence in the policy process; and the disparity, even in relation to their relative cost to the economy, between health and criminal justice Government research funding.

at the root of ineffective prevention: justifiable political and social demands for action against crime mean that agencies are under pressure to provide prevention measures and strategy now (Wikström, 2006; Wilcox & Hirschfield, 2007); yet, currently, criminology does not adequately meet the challenge of effectively informing policy (Blomberg et al., 2013; Manski, 2013; Rein & Winship, 1999; Sampson et al., 2013; Tittle, 2004; Wikström, 2007a). For example, Tittle claims that criminological knowledge is "quite shaky…there is not a single issue about which even a modestly demanding critic could be convinced" (by the available research evidence) (Tittle, 2004, p. 1941). Arguably, the inadequacy is due in part to the demand itself; policy makers' need for instant answers encourage researchers to sacrifice principles of rigorous research, which undermines the quality of the very information they need (Wilcox & Hirschfield, 2007). Some advocate that until criminology is better equipped, strong policy advice is unwise (Rein & Winship, 1999; Sampson et al., 2013; Tittle, 2004).

1.2.1: Approaches: prediction, explanation, prevention

Approaches to improving the policy relevance of criminology vary depending on the criminologist's interpretation of this challenge; and therefore differ in the role they play and the effectiveness with which they are able to inform policy. The interpretation of this challenge is determined by their world view.

1.2.1.1: Additive versus interactive world view

> *"Theory determines what kind of data are relevant and consequently determines what kind of procedure is appropriate, and overriding these determinations is a requirement of consistency with the general model within which the theory is formulated"*
>
> (Overton & Reese, 1973, p. 74)

The fundamentals of how a person sees the world will determine how they conceive the nature of certain elements of it, how they theorise about the processes that take place, the questions they ask, and the procedures and methods by which they attempt to answer those questions. Models are representations that "aid in the understanding and explanation of subject matter" (Overton & Reese, 1973, p. 67), and each world view determines a particular model. A particular model leads to a particular 'family of theories', and a particular 'family of procedures' (Overton & Reese, 1973). Two such world views are particularly relevant to the different approaches researchers take to crime prevention and will be discussed here.[18] Although these world views have been distinguished using various (and oftentimes overlapping) terminology throughout the

[18] This discussion focuses on these two generic world views due to their opposing implications for the approach to crime prevention and is not concerned with other world views that may exist.

history of the philosophy of science, this discussion focuses on their respectively additive or interactive natures.

In short, an *additive* world view determines theories based on conceptions of the whole being predictable from and decomposable into its parts. Causality is thus unidirectional (chainlike). Functions are mediators. Resultant research questions are about *which* factors have influence, and relatively, *how much* influence they have, and are therefore concerned with prediction. In contrast, an *interactive* world view understands individuals as active beings and causes as functional, and that the whole gives meaning to its parts. This conception means that there can be no one-way causality and no independent causes (see further, Bunge, 1963). This raises questions surrounding *how* components interact (including what specific conditions of components are relevant and which processes are involved, i.e., questions about *why*). These questions are concerned with explanation.[19] These world views determine theoretical approach, for example, the approach to the integration of individual and environmental perspectives on crime (see section 2.3.1:). The specific implications for data collection methods and analytical approach are expanded on in chapters 7 and 8.

> *"Because world views differ in such basic categories as truth criteria and the nature of substance and change, models and other conceptions based on different world views are incompatible and irreconcilable"*
>
> (Overton, 1973, p. 79)

The additive and interactive world views represent a paradigm clash and are totally incompatible (see also, Kuhn, 1962; Overton & Reese, 1973). As a result, the debate cannot be decided at the empirical level because proponents of each view interpret empirical work within their own paradigm – "there is no such thing as a crucial test among divergent assumptions" (Overton, 1973, p. 84). Instead, Overton argues that the argument for a particular world view must be made at a more fundamental level: at the level of "truth criteria and the nature of substance and change" (Overton, 1973, p.79). However, since the different world views result in such different theoretical and procedural approaches, I argue that the fundamental debate over which world view to take can be settled based on the effectiveness of the approach for prevention. The following sections outline three approaches to criminological research and evaluate them based on their ability to inform effective crime prevention. Section 1.2.3: then specifies further the approach that is argued to be most effective and in so doing introduces the concept of analytical

[19] For discussion of issues relevant to the social sciences and points drawn here, see, (Bunge, 1963, 2004, 2006; Elster, 2007; Gerring, 2008; Hedström & Ylikoski, 2010; Mahoney, 2001; Mayntz, 2004; Wikström, 2011)

criminology. This analytical approach, underpinned by an interactional world view, is the overarching approach taken by this thesis.[20]

Wikström and Treiber (2017) identify three distinct approaches to criminological research; i) describing the characteristics of who is at risk of committing crime and where and when places are at risk for being crime 'hot spots' - these studies are concerned with prediction, and are rooted in the additive world view; ii) explaining why and how crime happens - these studies are concerned with causation, and stem from an interactive world view; iii) assessing what works to effectively intervene in the causal process by which crime occurs - these studies are concerned with prevention and are not particularly rooted in either of the featured world views because they are concerned only with describing the effectiveness of policy rather than with then phenomena of crime itself. These three approaches will form the basis of the rest of this section and are summarised in Table 1.

Table 1: Approaches to criminological research

Aim	Research question	Approach	World view
Describe	Who, where, when	Prediction	Additive
Explain	Why, how	Causation	Interactive
Intervene	What works	Prevention	-

1.2.1.2: Prediction and explanation

> *"It is important in crime prevention to clearly understand the difference between prediction, causation and prevention and not to confuse 'what predicts' with 'what causes'"*
>
> (Wikström & Treiber, 2017, p. 75)

One of the main problems for successful translation of research to effective crime prevention policy is the widespread conflation of prediction (correlation and description) and causation (explanation) within the criminological discipline. (Bunge, 2006; Wikström, 2007b; Wikström & Treiber, 2013, 2017). The distinction between prediction and explanation is often ignored or confused in academic endeavour, statistics, and modern applications more broadly (Bunge, 2004; Dawid, Faigman, & Fienberg, 2013; Psillos, 2002); however, this distinction is not new (see, Holland, 1986). For example, Mill made the distinction between 'effects of causes' and 'causes of effects' (Mill, 1843)[21] in the 19th century.[22] Essentially, study of the 'effects of causes' involves

[20] The approach is also consistent with the systemic approach advocated by Bunge (2004), who states that systemism is "not a theory to replace other theories. It is, instead, a viewpoint or strategy for designing research projects whose aim is to discover some of the features of systems" Ibid, p. 191.
[21] Book III, chapter X, section VIII
[22] Others since have discussed this distinction in terms of 'forecasting' and 'attribution' (Dawid, Musio, & Fienberg, 2013).

description of a specific end state following a particular intervention or exposure, without reference or regard for the process by which that end state came to be. This approach can describe both the end state and the treatment (or multiple treatments) in great detail, but ultimately excludes consideration of theory and mechanism. By contrast, a 'causes of effects' approach is concerned with explicating mechanisms, which "refers to an explanation concerning how certain states lead to particular final states through a process or a series of processes involving different intermediate stages. Such explanation can be given at more or less detailed levels" (VanderWeele, 2009, p. 222). When explicating mechanisms, it is important to distinguish explanatory mechanisms from mediating variables (Hedström & Ylikoski, 2010; Mahoney, 2001). Mechanisms are processes in systems, and because they are for the most part imperceptible, they are usually represented by 'guesses' (theories) about how a process occurs (Bunge, 2004). Mechanisms cannot therefore be entered into a statistical analysis (e.g., as a mediating or intervening variable) but instead make sense of statistical relationships (see also, Elster, 2007; Gerring, 2008; Mayntz, 2004). Consideration of mechanisms (i.e., theory) is essential to a 'cause of effect' based explanatory approach.

The distinction between 'effects of causes' and 'causes of effects' has implications for the efficacy of the different approaches to criminological research that are presented in Table 1, and therefore their role in translational criminology and ability to inform effective crime prevention policy and practice. In principle, research that makes predictions about who will commit crime, where and when (causes of effects) is less able to effectively inform prevention than research that explains the effects of causes. This argument is detailed in the following paragraphs, and effectively places the search for the causes of crime at the heart of the crime prevention challenge.

> *"Devising and developing effective crime prevention requires a good understanding of the causes and causal processes involved"*
>
> (Wikström & Treiber, 2017, p. 75)

> *"Even if we could predict with 100 percent accuracy when a crime will happen, to effectively stop that crime from happening we need to know why it will happen"*
>
> (Wikström & Treiber, 2013, pp. 328-329)

A vast array of criminological research has shown that 'thousands' of variables correlate significantly with crime (Farrington, 1992, p. 256). The early investigations of the seminal Cambridge Study of Delinquent Development found that "practically every factor investigated proved to be associated to some extent with future delinquency" (West & Farrington, 1973, p. 189), and there is a 250 page handbook filled with over 5200 references to evidence of crime

correlates ranging from genetic and biological to psychological and social factors (Ellis et al., 2009). Hefty lists of disconnected risk factors unhelpfully imply that 'everything matters' (Matza, 1964) and it is difficult to make sense of these (too) many correlates and predictions. As Wikström and Treiber (2017) argue, statistical significance doesn't always mean real-world significance, though this point can be lost on policy makers who are in receipt of research that reports predictors of crime. Overall, this situation has contributed to an uncoordinated and haphazard 'pick 'n' mix' style selection of intervention programmes (Wikström, 2007a). Blomberg and colleagues state that "a common policy struggle, then, is the identification of the most appropriate and alterable risk factor that a particular policy or practice should address" (2013, p. 5).

Central to the policy struggle inherent in the crime prevention challenge is the scientific fact that altering causes is the only way to effect a change in an outcome. This means this challenge has become a hunt for the causes of crime, and more specifically, the holy grail of causal certainty. As Wikström states, "if we believe in crime prevention, we should make every effort to improve our knowledge about the causes of crime" (Wikström, 2007a, p. 73). However, although criminology has amassed an enormous number of studies identifying and discussing correlates of crime, "there is surprisingly little agreement about the causes" (Farrington, 1988, p. 75; see also, Farrington, 2003). Much of the reason why criminology has been unable to concordantly establish the causes of crime from amongst many thousands of risk factors is because of the flawed approach taken by most researchers to this task. In criminology, the main distinction between approaches to establishing 'causality' is that one starts out concerned with prediction, and the other, explanation. The fundamental problem with the former approach is that no matter how good a prediction is; it cannot establish causation.

A statistical correlation does not automatically imply causality; "what predicts is not necessarily what causes" (Wikström & Treiber, 2008, p. 8) and therefore, assessing risk is far from sufficient for effective crime prevention.

> *"Although all risk factors can be used to identify those most in need of an intervention and can be used to motivate further research, many, if not most, risk factors cannot be used to prevent or promote an outcome"*
>
> (Kraemer, Lowe, & Kupfer, 2005, p. 31)

Actually, not 'everything matters', and many factors that co-vary with crime are not causally relevant because they are markers (symptoms, indicators) (Farrington, 2000; Rutter, 2003; West & Farrington, 1973; Wikström, 2007b, 2010a, 2011), or are even just attributes (fixed markers)

(Wikström, 2010a, 2011, 2014), and attributes cannot be causes because they have no causal efficacy (Bunge, 2001; Holland, 1986). Traditionally, statistical regression methods were used to help reduce the number of risk factors (potential causes) by ruling out those correlates that were mediated by another correlate. For example, following the identification of many risk factors for delinquency amongst the Cambridge Study sample, West and Farrington report that "the analysis of the results consisted largely of a search for factors which had some importance independently of others" (West & Farrington, 1973, p. 189). This approach has remained largely the same, though arguably the techniques by which to pare down multiple risk factors and identify the ways in which they interact to produce an outcome via a moderator-mediator analysis have become more refined and technical over the years. Kraemer and her colleagues, within the framework of health research, distinguish between different types of risk factors (i.e., between; correlates, risk factors, fixed markers, variable risk factors, variable markers and causal risk factors) (Kraemer et al., 1997; Kraemer et al., 2005).[23] They distinguish causal risk factors as those that can be changed, in particular, that specific change in the causal risk factor is related to a change in the probability of a particular outcome, but they acknowledge that even once identified, "causal risk-factors are not necessarily "the cause" of a particular outcome" (Kraemer et al., 2005, p. 27).[24] This approach is also unable to explain how these complex factors interact.

A change in a cause is translated into a change in the outcome via the mechanism that links cause and effect. Crucial to this statement is the distinction between mediating variables and mechanisms. A mechanism is the (usually unobservable) process that links independent variables, including mediating variables, to the outcome (Bunge, 2001; Wikström, 2017). Therefore, a search for mechanisms does not involve identifying mediating variables, but instead aims to gain evidence that the proposed plausible often unobservable mechanism is at work (Wikström, 2017). Often studies that purport to explain crime by identifying mechanisms are actually identifying mediating factors.

Many studies of 'crime causation' either conflate prediction and explanation (for example, a chapter entitled 'search for causes' (Reckless, 1940, 1950) refers to various factors of criminal propensity rather than mechanisms that link cause and effect); or conflate mediating variables and causal mechanisms (for example, a recent study states that "increasing attention has been given to mechanisms that might explain the relationship between parenting and delinquency",

[23] For a review of the different types of risk and protective factors, see; Morizot and Kazemian (2015).
[24] Further, Mill points out that "when there are lots of causes (changes in them lead to changes in the effect), it is not possible to work out to each cause its real share in the production of the effect" (Mill, 1843, p. 449).

but goes on to cite studies that examine "various mediating mechanisms, including self-control, delinquent attitudes, and peer delinquency" (Janssen, 2015, p. 8).

Although perhaps not quite the 'gold standard' for establishing causality (Sampson, 2010), the only way to strictly establish true causality is to manipulate causes while holding all other variables constant and observe the effect on the outcome; i.e., experiment. However, when researching social phenomena such as crime, conducting experiments in order to establish causality is often impossibly problematic or ethically impossible, though some natural experiments and quasi-experiments attempt to attenuate the difficulties of true experimentation in this field. Luckily, a lack of experimental data does not preclude criminologists from researching the causes of crime (Sampson, 2010; Wikström & Sampson, 2006; Wikström & Treiber, 2013).

In an attempt to prove causal effects in the absence of experimental data, many criminologists and researchers from other fields that take a prediction approach (e.g., public health, epidemiology) have made use of statistical techniques designed to facilitate causal inferences. 'Statistical causality' is concerned with looking at effects (e.g., of a certain exposure or intervention), whilst neglecting the mechanisms by which those effects arise.[25] However, developments in these statistical causal inference techniques mean that model specification has become very important, whereby the best specified model produces the best explanation of the outcome. Therefore, in order to control confounding (unobserved) variables and conduct analysis of mediation and mechanism, establishing statistical causality inherently involves some scientific knowledge and a priori theory (see, for example, Dawid, Musio, et al., 2013; VanderWeele, 2009; Wikström & Sampson, 2006). By denying theoretical assumptions or keeping mechanisms implicit, researchers hinder the specification of their model and therefore reduce the efficacy with which they can establish causes (for a related discussion, see, Cox & Wermuth, 2004). It is important to be clear about what factors can in fact be causes. "Such clarity is essential, yet commonly absent, in policy-oriented studies in which decisions to implement real-world manipulations can result from the statistician's causal inferences" (Rubin, 1986, p. 962).

[25] Statistical causality is also known as experience- or counterfactual-based causality, or 'black box causality'. This is in contrast to 'mechanistic causality' (also known as 'econometric causality' or the 'scientific model of causality') which involves the application of theory and mechanism (Aalen & Frigessi, 2007; Heckman, 2008). See also the above distinction between mechanism and mediating variables (Bunge, 2004; Elster, 2007; Gerring, 2008; Hedström & Ylikoski, 2010; Mahoney, 2001).

In sum, experiments are a strong way to establish causality, and are designed to falsify theoretical hypotheses. In the absence of experimental data, an approach that is ultimately prediction based is unable to establish causality, nor test theoretical hypotheses. An a-theoretical statistical approach to establishing causality falls short because without taking mechanisms appropriately into account, statistics alone cannot establish causality (Cox & Wermuth, 2004; Einstein, 1934; Heckman, 2005, 2008; Overton & Reese, 1973; Sampson, 2010; Wikström & Sampson, 2006). "Causal inference is ultimately tied up with causal explanation, which resides at a theoretical level and is not something that comes directly from the data." (Sampson, 2010, p. 491). In other words, regardless of the experiment or statistical method employed, causal explanation requires theory. Without theory, empirical research lacks social meaning and policy relevance (Hedström, 2005; Pauwels, Ponsaers, & Svensson, 2009). For this reason, it is important to take a theoretically-driven explanation approach to crime research.[26] Such an approach is advocated by proponents of 'Analytical Criminology' (Pauwels et al., 2009; Wikström, 2017; Wikström & Treiber, 2013) (see section 1.2.3:) and is the guiding approach taken by the research presented in this thesis.

1.2.1.3: Prevention and causation: what works and how it works

> *"Policy measures need to be accurate. Applied to the field of crime, this means that policy measures are supposed to be effective, i.e. that they succeed in reducing crime as a social phenomenon. Therefore policy measures need to influence factors that are causally related to crime"*
>
> (Pauwels et al., 2009, p. 136)

Examining the difference between the 'how it works' and 'what works' questions is the key to the distinction between the prevention and the causation approaches to criminological research. Wikström draws this distinction by explicitly distinguishing between a knowledge base and an evidence base (2007a). According to Wikström, the knowledge base represents the best knowledge we have about crime and the causes of crime resulting from theoretical developments and their empirical support (understanding 'how it works'), whereas the evidence base should guide the selection of particular crime prevention measures for implementation by scientifically evaluating their effectiveness (assessing 'what works'). This distinction is quite apparent in disciplines where there is a greater degree of separation between the pure and applied than there is in criminology, for example, physics and engineering. Despite the need for symbiosis, as

[26] A recent paper by Jennings, Fox and Farrington (2014) is an example of where statistical analysis (propensity score matching using longitudinal data) is used to demonstrate that a correlate of crime (tattoos) is not causal, but rather a marker for other factors related to life course offending (which may themselves be causal). Whilst this paper is quite correct in showing this to be the case, an explanatory approach guided by a theory positing plausible causes would avoid such unnecessary research altogether. The correlation between tattoos and crime would never have been regarded as a candidate cause of crime worthy of investigation.

Moore states, "applied sciences often develop somewhat independently of basic sciences, and there is no reason to suppose that this would be any less true in the social sciences" (1995, p. 305).

By distinguishing between an evidence base and a knowledge base within criminology, Wikström makes the crucial argument that it is the knowledge base that advises the causes of crime to be addressed by such interventions, and therefore it is the knowledge base that should be the 'point of departure' for the development of crime prevention strategy. For Wikström, "the first question for crime prevention should be, 'How does it work?' and only the second question should be, 'what works?'" (Wikström, 2007a, p. 63). Of course, in practice the knowledge and evidence bases are both a 'work in progress' and the evidence about what works is often beneficial to continued research into how it works.[27] Findings from intervention evaluation research (the evidence base) can have impact on the knowledge base; for example, null results following a correctly implemented intervention informed by the knowledge base may point to a need for further refinement of the causal processes outlined by the knowledge base. In sum, a strong knowledge base, used to inform the development of intervention programmes which are subsequently subject to evaluation, is the best route to effective crime prevention. This idea echoes the presence of both pure and applied research in the foundations of the discipline of criminology.

Such a distinction between an evidence-base and a knowledge-base is notably absent from existing analogies between the medical profession and crime prevention (such as those by Reiss, 1991; Reiss, 1995; Sherman, 1998; Sherman et al., 2002b); however, the analogy can be gainfully extended using this nuanced distinction. When considering causal inference and medicine, Holland observed that "medicine is more difficult when the biological theory is less well developed" (Holland, 1986, p. 956); i.e., understanding plausible mechanisms for disease makes treatment more effective. In medicine, knowledge about the causes of a disease is applied to the development of a drug that is intended to act on those mechanisms in order to treat that disease. Notably, this informed drug development process takes place *before* that drug goes to clinical trial to evaluate if it works. Sherman is quite right that crime prevention can and should learn from modern medicine to evaluate its effects (Sherman, 1998; Sherman et al., 2002b), i.e., the importance of scientifically evaluating 'what works'; but crime prevention also needs to learn from medical science the importance of understanding both the human body and disease and also the causal process that results in the disease, i.e., the importance of understanding 'how it

[27] The value of insights into the causes of crime gained via evaluation of prevention measures was acknowledged long ago (e.g., Reckless, 1940).

works'. The implicit basis of criminology, and more recently criminologists such as Wikström and others (e.g., 2007a; Wikström & Treiber, 2017) remind us that both causation and prevention approaches are needed for effective crime prevention.

Perhaps too many researchers now focus on a prevention approach to policy, though this has not always been the case. Criminologists have been decrying our knowledge of 'what works' in terms of crime prevention for decades. For example, in 1967, Rodman and Grams called for better assessment of intervention programmes on the basis that many were ineffectual and costly, most went without evaluation and, worryingly, that "the only projects that seem to be able to report success are those that have not been independently evaluated" (Rodman & Grams, 1967). More recently, the response to the challenge of informing crime reduction policy within a 'prevention approach' resulted in calls for a stronger evidence-base within criminology (Sherman, 1998; Sherman et al., 2002a, 2002b; Welsh & Farrington, 2002; Wilcox & Hirschfield, 2007). For example, for Sherman et al., 'what works, what doesn't, and what is promising' are the important questions for crime prevention, (2002a, p. xiii). Following such calls, the patchy evidence base is at last being addressed. This is evidenced by the recent growth of experimental criminology, the explosion in randomised control trials, and the increased popularity, funding, publication opportunities, and practitioner collaboration associated with this kind of research in recent years (Sampson, 2010). Although there is much work to be done (and some caution to be exercised, see, for example, Sampson, 2010), the scene is at least set for improvements in our understanding of what works in crime prevention. As an applied science, criminology has thus rallied to provide evidence that interventions work (or not) in the expected manner to an effective degree.

Sampson et al. observe that this attempt to make criminological research more translatable into policy has meant that the spotlight has shifted from the root causes of crime (causes of effect) to a policy-based criminology focussing on treatments (effects of a cause). "The question has shifted from 'what causes crime' to 'did a program work?'" (Sampson et al., 2013, p. 589). The rise of the prevention approach represents a move away from questions of why and how (causation approach). An increasing number of researchers are stating that a strong knowledge base is absent in criminology (Blomberg et al., 2013; Manski, 2013; Rein & Winship, 1999; Sampson et al., 2013; Tittle, 2004; Wikström, 2007a). By taking a prevention approach *instead of* rather than *guided by* a causation approach, criminology is still failing to meet the crime prevention challenge. In the absence of knowledge about the causes of crime, a 'what works'

approach represents 'making do'. As is made clear in the following section, this 'making do' is problematic.

1.2.2: 'Making do' (and why it isn't 'good enough')

> *"As medical knowledge has limitations on the causes of cancer and numerous other diseases, criminology and public policy is not an all or nothing proposition. Rather, it is possible to improve crime and justice policy decisions with what we now know in ever-advancing and incremental steps as more scientific knowledge and causal inferences become available"*
>
> (Blomberg et al., 2013, pp. 577-578)

> *"It is clear that much research needs to be done. However, policymakers need not wait until all that has been accomplished."*
>
> (Loeber & Stouthamer-Loeber, 1986, p. 131)

> *"While differential crime risks… do not tell why persons become criminal, they do tell what persons become criminals. Instead of pointing to causality, they indicate contingency, which is a more than accidental association of visibly recorded traits and conditions with persons who become officially recorded as offenders. Moreover, valid studies of differential crime risks should lead the way to effective preventive measures, by specifying the levels and categories of individuals in any society who are the most likely to become official offenders"*
>
> (Reckless, 1940, p. 3)

Arguments in favour of particular interventions (usually implicitly) presuppose that there is clarity about the causes of crime (Pease, 2002). As previously argued, this is not the case, in spite of an apparent causal focus for much of criminology's history (Blomberg et al., 2013). Until criminology can boast more certain knowledge about the causes of crime, some argue that strong policy advice may be premature (Manski, 2013; Rein & Winship, 1999; Sampson et al., 2013; Tittle, 2004). Yet the problem remains: offenders continue to offend whilst criminology works out how to best inform policy, and an apparent lack of both willing on the part of criminologists and support on the part of funding bodies implies that the hindered knowledge base may take some time to meet the crime prevention challenge.[28] However, there is interim help available, for example, an article by Sampson and colleagues "seeks to resolve this tension by assessing

[28] Improving knowledge about the causes of crime is far from being at the heart of the crime prevention agenda. Although a UK Government White Paper on 'modernising government' stated that policies of all kinds should tackle "causes not symptoms" (Cabinet Office, 1999, p. 15), findings about causality and questions of 'why' are a stubbornly vague and implicit part of the concept of 'evidence' in Wilcox and Hirschfield's study of the types and role of evidence in relation to UK crime policy (2007, pp. 17-22). Unfortunately, the fundamental knowledge base about the causes of crime looks set to remain woefully unable to adequately inform crime prevention. For example, in relation to the UK, Wilcox and Hirschfield found that not only did the Home Office appear unable to even calculate the proportion of research funding spent on research into the causes of crime, analysis of output showed that less than one percent of Home Office funded research related to studies that would improve policy makers' understanding of the nature of the problem and how to address it (most instead related to the production of management statistics, public perceptions of crime, and evaluations of programmes) (Wilcox & Hirschfield, 2007, pp. 50-52). Add to this the apparent focus on prediction and risk factors and neglect of mechanisms and process in much of the research that does exist to inform policy, and the near future of the under-labouring role of the knowledge base in criminology looks bleak.

principles and strategies for informing policy in a causally uncertain world" (Sampson et al., 2013, p. 587). Despite the absence of causal certainty, in the face of the demand for immediate action against crime, policy makers must 'make do' with the best research information available from both science and practical experience (Blomberg et al., 2013; Latessa, Cullen, & Gendreau, 2002; Sampson et al., 2013; Wikström & Torstensson, 1999).

Nearly half a century ago, Hill made a 'case for action' in the face of incomplete science, stating that those in the field of preventative medicine can't "sit around awaiting the results of research" (1965, p. 295). We might learn from experience in other fields that 'making do' with the best current knowledge and available evidence needn't represent disaster for crime prevention efforts, at least in the short term. As Moore writes, "one might be able to act on a problem effectively *even if one doesn't fully understand its causes!* In short, biology and physics did not have to be complete to begin making some progress in healing people or designing bridges or airplanes" (1995, p. 305, original emphasis). Reiss gives the example that improved sanitation positively impacted on the prevalence of disease despite our only gradual understanding of the (proximal) cause of disease (i.e., germs) (1991, p. 28). There are those who argue that the social sciences should follow the lead of the medical profession and target problems using information that is currently known despite the limitations of that knowledge (Blomberg et al., 2013; Rein & Winship, 1999).

To state the fundamental importance of the knowledge base for crime prevention is not to deny the possibility of success of crime prevention measures developed in the absence of a sound knowledge base. Risk refers to the probability of an outcome within a population (Kraemer et al., 1997), and therefore an epidemiological style approach to crime prevention can and does have successes; "one can prevent criminal events or control their consequences without a scientific or theoretical understanding of their causes" (Reiss, 1991, p. 28). In this sense, Blomberg et. al., point out that such 'making do' should "'target the problem' which may not directly address causes *per se* but rather the proximate and malleable manifestations of the problem in question" (2013, p. 576). What is arguably a 'quick and dirty' approach proves effective under certain conditions. Hill suggested that in particular circumstances, a 'few links' of the causal chain may suffice for preventative medicine (Hill, 1965) and this was echoed more recently by Murray et. al., who stated that evidence of correlates might be sufficient for certain purposes such as screening or risk assessment (2009). Meta-analyses suggest that, although modest, there have been some reductions in offending achieved through the use of a range of interventions which mostly use offending risk assessment and management toolkits (Communities that Care on behalf of the Youth Justice Board, 2005; Lipsey, 1992), and there are particular kinds of

interventions that have been effective to some degree in reducing crime despite having been devised in the absence of integrated knowledge about the causes of crime.

However, whilst 'making do' can result in desirable outcomes such as these, there are clear reasons why this should not represent the end of the scientific search for the root causes of crime. Situational Crime Prevention and Multi-Systemic Therapy interventions are examples of crime prevention measures that were developed and implemented in the absence of a sound knowledge base about its causes, and yet demonstrate apparent crime prevention successes. These are addressed as case studies in appendix section 12. This discussion also makes clear that these interventions far from solve the problem of crime, meaning that there is still work to be done. Wikström (2007a) goes further to argue that the success of interventions devised without attention to the causes of crime results from the luck of influencing a cause, and that…

> *"…the better we know the causes, the more likely we are to spend our time and money on interventions that have the prospect of being effective (rather than wasting time and money in capitalising on the odd chance that some of our actions may be successful)"*
>
> (Wikström, 2007a, pp. 77-78).

By 'making do' with a prediction approach to crime reduction, we are not allowing our prevention efforts to have the most impact. Wikström and Treiber (2017) make the point that most factors that statistically predict crime only account for a small proportion of the explained variance and are therefore not particularly strong predictors. Prevention efforts that target only weak predictors can have only a small impact on crime outcomes because they only serve to focus resources on the most at risk groups or places and times, but can't guide the content of the prevention efforts and specify how to actually prevent crime (Wikström & Treiber, 2017). Of course, while any impact on crime involvement is desirable, identification of causes allows us to begin to develop policies and interventions that can actually prevent crime from happening.

> *"Wishful thinking is no substitute for theoretical understanding. Underlying most crime prevention failures… is bad science"*
>
> (Grabosky, 1996, p. 39)

> *"An intervention may fail to produce the intended effects because of mistaken conclusions about the causes of events or behaviour"*
>
> (Reiss, 1991, p. 25)

Extension of the medical analogy provides further evidence that 'making do' is not good enough. While Epidemiology has often been successful in taking what is at best a risk-oriented and at worst a 'trial and error' approach to public health, it would be a problematic approach to apply to medicine as a whole without also developing understanding of the causes of disease and poor

health. Whilst the inexorable tide of illness and disease has forced medics to practise treatments and implement strategy (and evaluate their efficacy) even in the absence of sound knowledge about the causes of that which they treat, a very fundamental part of medical science is and always has been the pursuit of knowledge about the functioning of the human body and disease. Applying this argument to Reiss' sanitation example suggests that an epidemiological approach, alone, is not good enough: before we knew about the existence of germs we knew that sanitation improved health outcomes, however, once we knew about germs (as a cause of disease) we knew more about exactly what kind of sanitation was needed, for which groups, under what circumstances, in order to have the best (and most efficient) impact on health.

In summary, even successful examples are far from the last word in crime prevention and could be much improved and refined. By disregarding the knowledge base altogether or relying on an inadequate knowledge base, even when we are 'lucky', or correct in our educated guesses; interventions are too broadly or incorrectly targeted because we ignore the details of the notoriously complex and nuanced processes involved in crime causation. Our practical successes could be improved, better targeted, and made more cost effective.

1.2.2.1: Doing harm

Furthermore, 'making do' may even cause harm; again, we can look to medicine to illustrate the point that we should improve our understanding of something in order to not only better prevent it, but to not cause harm in doing so. A principle precept of medical ethics is non-maleficence (or 'first, cause no harm'), yet we are sometimes horrified to look back at medical methods in times gone past. The development of most treatments and procedures in modern medicine (e.g., chemotherapy, antipsychotics, organ transplants, amputation) have been strongly guided by i) improvements in knowledge about the causes of the problem (disease), ii) prior understanding of the causal mechanism by which the intervention (treatment) will have its intended effect, and iii) knowledge of the functioning of the system (body) as a whole and therefore appreciation of unintended (biomedical) implications. Although evaluations of treatments are an important and necessary part of medicine, treatments are often refined or abandoned altogether in favour of new procedures developed as a result of *new knowledge* rather than as a result of evaluations of efficacy (evidence), and perhaps procedures that turned out to

be ineffectual or harmful would not have come to be adopted had the knowledge about the causes of the problem already been known.[29]

What of non-maleficence in crime prevention? Social interventions ultimately aim to alter human behaviour, and if we believe that they can have a positive effect, we also must believe that they are capable of bringing about harmful consequences, however unintended (McCord, 2003; Rhule, 2005). This means that those involved in devising, selecting, and implementing crime prevention programmes have an ethical responsibility. Arguably, as in medicine, this responsibility should be recognised professionally and represent more than just 'good intentions'.[30]

Such ethical responsibility is important because evaluations of interventions for youth problem behaviour show a growing number of programmes that have been carefully devised and implemented with the best of intentions that yet still result in (long term) harm (Dishion, McCord, & Poulin, 1999; Grabosky, 1996; McCord, 2003; Rhule, 2005). For example, meta-analyses show that 10% of programmes showed negative effect sizes (Redondo, Garrido, & Sánchez-Meca, 1997), and 30% resulted in some form of iatrogenic outcome. Furthermore, these are likely to be underestimates due to the 'file drawer' problem (Dishion et al., 1999), whereby null or negative effects are less likely to be published (Rosenthal, 1979). Furthermore, even if programmes are effective as intended, there is a number of other ways in which they can fail (Grabosky, 1996, p. 25).[31] For example, Byrne and Pease (2003) provide examples where harm was manifest but not in the domain targeted by the programme to illustrate that the success of interventions aimed at reducing crime shouldn't just be measured on the basis of crime outcomes alone.

The examples of failure from prevention history highlight the importance of the evidence base (evidence about what works). "Unless social programs are evaluated for potential harm as well as

[29] For example, medical practices such as a lobotomy to (prevent psychosis) and skull trephination (to cure seizures, migraines and mental disorders) were abandoned in the light of new knowledge about the nature and causes of neurological disorders and mental illness.

[30] 'Principle A' (beneficence and non-maleficence) of the Ethical Principles of Psychologists and Code of Conduct states that "psychologists strive to benefit those with whom they work and take care to do no harm" (American Psychological Association, 2002), however, this principle is purely aspirational and nothing like a medical oath.

[31] For example; the success of a programme may be let down by one element, e.g., the community component of the 'Nokomis Challenge Program' (Deschenes, Greenwood, & Marshall, 1996); the intended mechanism may backfire due to programme delivery, e.g., the negative effects associated with aggregating groups of at risk or delinquent peers for cognitive behavioural therapy in the Adolescent Transitions Program (Dishion & Andrews, 1995; Poulin, Dishion, & Burraston, 2001); and there may be unintended consequences, as in the Cambridge-Somerville Youth Study, when interventions may result in benefits in one area (such as reduction in offending) but lead to harm in another (e.g., families, schools, communities) that may impact on crime and social disruption (see, e.g., MacKenzie, 2006; McCord, 2003).

benefit, safety as well as efficacy, the choice of which social programs to use will remain a dangerous guess" (McCord, 2003, p. 17).[32] However, although this fact is not usually explicitly discussed in evaluations and reviews of prevention programmes, a key reason behind the failure of many programmes is the lack of (or lack of application of) knowledge about the causes of the behaviour that the programmes is attempting to modify (see also, Grabosky, 1996).[33] Even interventions that prove to be very popular can be shown to fail once evaluated because they were formulated in the absence of knowledge about the causes of the behaviour they attempted to modify.[34]

In addition to inefficiencies in and poor targeting of prevention efforts, the possibility (and history) of iatrogenic effects mean that no criminologist should ever accept that 'making do' is a 'good enough' approach to crime prevention.

> *"The fact is, criminologists and other sociologists are as likely to be wrong as right and in the process they can easily cause damage. Here we are not talking about innocuous outcomes but instead matters of life, safety, and freedom. Being wrong can be very costly. To my way of thinking it is not acceptable to dismiss such damage by saying that we simply act on what we think we know at a given point in time"*
>
> (Tittle, 2004, p. 1641)

In spite of apparent successes, approaches reliant on 'good enough theory' are unscientific. In light of the evidence of iatrogenic effects resulting from a poor knowledge base, this approach seems negligent, and the following statement (written in relation to the Situational Crime Prevention approach), seems reckless:

> *"…being practical poses a very good discipline on us. Make it work! If it does not work, it probably is not a very good science in the first place. If it does work, science will improve too."*
>
> (Felson & Boba, 2010, p. 179)

Far from being 'good enough', this approach is unacceptable, and certainly not one that would be palatable in the context of medical science. Arguably, whilst 'making do' may be a necessary

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[32] Researchers also highlight the importance of improving the quality, validity and completeness of the evidence base, for example by assessing adverse affects, publishing negative results and tightening evaluation procedures (for an overview, see, McCord, 2003).

[33] The distinction between 'effects of causes' and the 'causes of effects' also has implications for iatrogenic effects outside of crime prevention. In legal cases courts use 'proof on balance of probabilities', which is intended to be a calculated probability of causation, but this can be flawed, with devastating consequences. For example, statistician Phillip Dawid showed that a wrongful conviction was based on invalid statistics and incorrect causal logic (Royal Statistical Society, 2001).

[34] The clearest example of this is 'Scared Straight', the intervention devised by New Jersey inmates in the 1970's that aimed to deter juvenile offenders by showing them realistic depictions of life in prison and presentations by inmates, but this was conceived without an understanding (nor evidence) of the mechanisms by which this might occur. 'Scared Straight' was implemented in 30 jurisdictions across the USA before evaluators concluded that the intended effect was not in evidence and in fact that "doing nothing would have been better than exposing juveniles to the program" (Petrosino, Turpin-Petrosino, & Buehler, 2003, p. 58).

stopgap in the absence of a coherent knowledge base, in time it has become the norm. Practitioners, policy makers, and academics have become desensitised to and no longer aware of the potentially serious pitfalls of 'making do'. This means that addressing the inadequate knowledge base seems less urgent, and understanding the causes of crime falls further down the list of priorities competing for pressurised resources.

In a utopian world of perfect crime prevention strategy, attention to the in-depth and comprehensive knowledge base about the causes of crime (and their intricacies and nuances) first facilitates a coherent, structured and effective strategy, and then allows programme developers to better understand the implications of the complexities of iatrogenic effects, and appreciate, for example, when efficiency savings like group delivery might be appropriate and when not, or when a proposed intervention might work with some subgroups or environments and not others. In his discussion of the unintended consequences of crime prevention, Grabosky (1996) lists some common problems with crime prevention measures and details how many of the types of regressive crime prevention identified have 'poor causal analysis' at their root. By addressing these problems, a strong knowledge base benefits the development of successful prevention programmes by allowing the application of an understanding of the causal process in order to prevent or reduce i) inappropriate or over-generalisation (programmes may only work with certain people in certain places), ii) intervening at an inappropriate point in the causal process (programmes must treat the causes of a problem rather than its symptoms), and iii) the inadvertent triggering of other causal processes (programme devisers should understand not just the behaviour of interest and it's causal mechanisms, but it's the role in the wider interrelated nature of social systems and processes)(for further discussion, see, Grabosky, 1996; and see also, McCord, 2003). In order to further inform this process, interventions and policy must also be subject to subsequent evaluation (Wikström & Torstensson, 1999), and in this sense the 'what works' approach forms an integral part of the contribution of criminology to crime prevention.

As with medical procedures, crime prevention measures should at the very least do no harm, but, like disease, crime is a serious problem and therefore our crime prevention efforts should be ambitious. As a society we must act on crime now, and therefore 'make do' with the inadequate knowledge we have about the causes of crime. However, as analogies to medicine remind us (e.g., Ludwig, Kling, & Mullainathan, 2011), the long term aim should also be ambitious: It must be a fundamental aim of criminology to develop the knowledge base as a matter of ongoing urgency so that our measures to prevent crime can be better guided (e.g., developed, targeted, or

abandoned) in order that we cause no harm and reduce crime as effectively and efficiently as possible. (see also, Ekblom, 1994; Wikström, 2007a).

> *"…criminologists can and should continue to pursue their scientific interests in causality while simultaneously pursuing ways to inform crime-related policy with the best available research knowledge"*
>
> (Blomberg et al., 2013, p. 576)

1.2.3: Analytical Criminology for effective crime prevention

> *"Rational preventive action ought to be based on aetiological theory"*
>
> (West & Farrington, 1973, p. 204)

> *"…if we ever expect our work to influence society, we must gain public credibility by building a body of reliable knowledge […] The most useful and reliable knowledge is likely to be that developed following the canons of science. Those canons are not value free but instead require theory that […] is designed to explain human behaviour and social organisation as well as changes to each. It mandates that such theory be thoroughly tested and confirmed by empirical studies in which the possibility of negative evidence is seriously entertained. Finally, it demands that such work satisfy a community of critics who are themselves trained in the rigors of science"*
>
> (Tittle, 2004, p. 1642).

> *"advancing knowledge about crime causation will, in the first instance, be a question of more extensive analytical work which aims to sort causes from correlates by identifying plausible causal mechanisms"*
>
> (Wikström, 2006, p. 69).

> *"Analytical criminology should not be interpreted as one more paradigm, but as a highly useful type of both theorizing and conducting research"*
>
> (Pauwels et al., 2009, p. 152)

> *"We suggest taking an analytical approach to identify factors which could plausibly be causes of crime and delineate the causal processes by which they might influence criminal action, and then undertake robust theory testing to advance the knowledge-base regarding these key factors and their relationship with crime"*
>
> (Wikström & Treiber, 2017, p. 76)

This section concludes the arguments presented in this chapter by introducing a particular approach to theory and research. Currently within criminology there is some impetus towards an 'analytical criminology' (Pauwels et al., 2009; Matsueda, 2017; Wikström, 2012, 2017; Wikström & Treiber, 2013). This is led by and most apparent in the analytical approach epitomised by SAT. Analytical criminology has its roots in analytical sociology, which builds on the visions of Durkheim and Merton. The analytical approach sits firmly within an interactive world view (section 1.2.1.1:), and argues for a focus on the 'how' and 'why' questions. These are best

answered using three principles: explanation; dissection and abstraction; and precision and clarity (Hedström, 2005; Pauwels et al., 2009).

Wikström argues that analytical criminology is the 'remedy' to some of the problems that currently plague criminological theory and research (2017, p. 502). For example, Wikström and Treiber state that this approach is much needed in criminology because the discipline "tends to focus too much on prediction and too little on explanation and that this hampers the advancement of knowledge about the causes of crime and its prevention" (2013, p. 319). The principles of the realist approach of analytical criminology means that it aims to discover rather than invent causes (Wikström, 2017). Many explanatory processes that link cause and effect are unobservable (Bunge, 2006) which means that to explain we must provide plausible processes that link the cause and effect (Wikström, 2011, 2017). As Hedström argues, "in order for a theory to be explanatory it must consider the reasons why individuals act as they do" (2005, p. 36).

The analytical approach aims to balance theory, empirical research and policy (Elster, 1989; Hedström, 2005; Pauwels et al., 2009). The remainder of this section will serve as a conclusion to this chapter by outlining the implications of analytical criminology for theory, empirical research and policy by addressing the principles of explanation, dissection and precision upon which the analytical criminology approach is founded.

1.2.3.1: Explanation

Explanations add to descriptions by answering questions about why and how. Explanations should focus on mechanisms, which are plausible reasons why a putative cause brings about an effect (Elster, 1989; Wikström & Sampson, 2006). When their dynamic character is highlighted, mechanisms are also known as processes (Pauwels et al., 2009). Although definitions of mechanisms differ, all state that mechanisms explain observed regularities by detailing how these happen (Pauwels et al., 2009).

A guiding theoretical framework is central to the task of explicating mechanisms because it provides an (often unobservable) plausible process by which social action links cause and effect (Bunge, 2004; Coleman, 1986; Wikström & Sampson, 2006). In order to explain the link between individuals and environments and crime, we need to specify the causal mechanisms within an action theory (Wikström, 2006; Wikström & Treiber, 2013).

Theory is not a list of statistically relevant factors (Hedström, 2005; Wikström, 2004, 2014). Rather, using strong theory to frame an explanatory approach (as opposed to taking a prediction

or risk factor approach) minimises the number of suggested and correlated risk factors to those factors that have explanatory power in a cause-oriented prevention strategy (Wikström, 2006, 2007a), and further, from among these, can sort the causes from the causes of the causes (see further, section 2.4:).

> *"Only factors that affect (help initiate, thwart or interrupt) processes that move people to engage in acts of crime are causally relevant factors in crime causation. To be a causally relevant factor means that if the factor is manipulated it will affect the outcome (in one way or another)"*
>
> (Wikström, 2010a, pp. 214-215)

By taking an explanatory approach to prevention in this way, fundamental factors that generate crime become the target for intervention strategies. Although they may show some positive results in the short term, 'situational crime prevention' techniques and law enforcement initiatives are unlikely to have a long term effective impact on the more fundamental factors relevant to the generation of crime (Wikström, 2007a). A meta-analysis of young offender programmes shows that "programmes that were based on a theoretical principle were an average of five times more effective than those who had no particular theoretical basis" (Izzo & Ross, 1990, p. 138).

Wikström (2007a) identifies the lack of an organising framework of knowledge about the causes of crime as the key barrier to coordinated, integrated, and organised crime prevention policy and practice. Research has identified a number of fundamental problems encountered in the UK by crime prevention approaches, organisations and actors (see, e.g., Bullock & Tilley, 2003; Byrne & Pease, 2003; Hope & Murphy, 1983; Liddle & Gelsthorpe, 1994a, 1994b; Phillips, Considine, & Lewis, 2000; Wikström, 2007a; Wilcox & Hirschfield, 2007). Any or all of these problems would benefit in some way from a crime prevention strategy that coordinates with a healthy knowledge base by placing a strong integrative theoretical framework with which to understand crime at its core (see, e.g., Wikström, 2007a).

As argued in section 1.2.1:, regardless of how successfully we can predict crime, explaining the mechanisms by which crime occurs is the only way in which we can hope to effectively prevent it.

1.2.3.2: Dissection and abstraction

> *"Dissection refers to the decomposition of both a social phenomenon and its causes and causal mechanisms that explain the outcome. Such a dissection should result in the reduction of a social phenomenon to its essence. The researcher should abstract this essential information about a social phenomenon theoretically"*
>
> (Pauwels et al., 2009, p. 143)

The organising theoretical framework advocated above allows researchers to empirically translate theoretical concepts into observable and measureable factors via dissection and abstraction. These are crucial activities for the analytical criminologist that aid our understanding of mechanisms and processes (Hedström, 2005; Pauwels et al., 2009). Detailing specifically and clearly what is meant by a particular theoretical concept is crucial to then develop measures to capture that concept empirically and formulate a specific analytical approach based on how that concept is theoretically understood to relate to others. This analytical plan aims to specifically and rigorously test a set of specific hypotheses derived from the theoretical framework.

The prediction approach takes the opposite approach to analysis, instead statistically testing the relative (and cumulative) predictive power of a number of factors. For example, the risk factor approach is an "empirically very strong, but theoretically rather weak, approach" (Wikström, 2005, p. 237). This results in a situation when researchers can establish that a factor may be important, but not the specifics of how or why that factor is causally relevant. Within the prediction approach, the nature of a particular predictor and the mechanisms by which it may be a cause are often very vague. West and Farrington themselves observed that "poor parental behaviour was a particularly important factor, both on account of its statistical significance as a predictor, and because of it theoretical implications. Unfortunately, it was not a very well defined entity" (West & Farrington, 1973, p. 193). They did not, however, go on to tease apart the different elements of parental behaviour nor theorise the specifics of the mechanisms linking parental behaviours and crime. This means they did not provide details of factors by which the concept of parental behaviour could be properly measured and observed, and were unable to assess the causal process in which parental behaviour may be implicated.

By contrast the analytical approach, rooted in explanation, often requires very detailed and specific descriptions of key concepts, particular and specific methodologies such as path analyses (Pauwels et al., 2009) or alternative forms of data collection and analysis such as that presented and discussed in chapter 7, to test specific hypotheses. These theory-driven hypotheses for empirical testing should aim to be as simple as possible but not at the expense of precision.

1.2.3.3: Simplicity and precision

> *"We have now assigned to reason and experience their place within the system of theoretical physics. Reason gives the structure to the system; the data of experience and their mutual relations are to correspond exactly to consequences in the theory"*
>
> (Einstein, 1934, p. 165).

We should not be afraid of complex but well specified and testable theories. As Sampson et al. argue, we should be moving "towards complex parsimony" (Sampson et al., 2013, p. 23). There is a clear need for the application of a theory that is simple and precise in that i) it identifies limited numbers of key causal factors and mechanisms (simple) so we can discard irrelevant crime correlates and ii) provides clear testable implications (precise) to avoid developing crime prevention measures that have no causal efficacy (Wikström, 2011). Testing simple and precise theory leaves no room for ambiguity and misinterpretation in the results of analyses (Pauwels et al., 2009).

Firstly, to be simple, the theory must identify a limited number of key causal factors and mechanisms. However, delivering a small number of causal factors integrated in a framework of causal processes need not mean that the theory is simplistic. In fact, over-simplification is to be avoided, and goes against the principles of an analytical approach (Pauwels et al., 2009). 'Ockham's razor' is a problem-solving principle attributed to William of Ockham (c. 1287–1347). It is a law of parsimony that pleads for simplicity, stating that 'entities should not be multiplied unnecessarily'. However, application of Ockham's razor can result in an over-simplified explanation that leads to a false conclusion. On these grounds (though not in direct response to Ockham), Einstein warned against too much simplicity. In what has become referred to as 'Einstein's razor', he suggested theory should be kept simple and not over-complicated, but we should not simplify it so far that it becomes wrong:

> *"It can scarcely be denied that the supreme goal of all theory is to make the irreducible basic elements as simple and as few as possible without having to surrender the adequate representation of a single datum of experience".*
>
> (Einstein, 1934, p. 165).[35]

In Criminology, some unfortunately prefer Ockham's razor to Einstein's. For example, Felson and Boba state that "unfortunately, it is cumbersome to study time and space together. There is too much happening. To make sense of it all, we need theories to cut down on details and

[35] "*Everything should be as simple as it can be, but not simpler"* is a misquote often attributed to Einstein that probably originates from this statement.

organize the ones we have." (Felson & Boba, 2010, p. 150). They argue that Routine Activity Theory (RAT) achieves this. RAT is a subsidiary of Rational Choice Theory (RCT), and both are guilty of over-simplification by losing sight of the offender. For example, RAT presents a 'simple' theoretical model of the role of features of environments and their circumstances in crime, but one that 'over-simplifies' by minimising attention to individual differences, which has led to an inadequate set of implications for prevention. The practical implications of RCT and RAT have heavily influenced Situational Crime Prevention (which is by definition an approach that emphasises simple engineering-based solutions to crime). SCP can be criticised for stubbornly avoiding anything complex in order to stay 'useful': "The move towards a more dynamic, interactionist model has been resisted, for fear that it would compromise Rational Choice Perspective's radical parsimony, a condition of its heuristic usefulness" (Bouhana, 2013, p. 3). As Bouhana says, this "runs roughshod" (p. 3) over Einstein's razor. The result is that SCP, despite successes, can only have limited success in preventing crime because it entirely ignores individuals and individual differences; and has diverted attention and funding away from potentially more effective integrative intervention policies that take account of both environments and offenders (and particular individuals in particular environments) (see also section 1.2.2:).

> *"There is no 'theory free' policy inference of the sort that politicians seem to wish for. Criminologists would thus do well to resist the urge (or demand) to seek technical policy fixes"*
>
> (Sampson, 2010, p. 498).

Secondly, to be precise, the theory must provide clear testable implications. Theory needs to be plausible, but we need knowledge to know if it is plausible: as Hill stated, "what is biologically plausible depends upon the biological knowledge of the day" (Hill, 1965, p. 298). For this reason, analytical criminology and science more generally demand that theory be tested. Thus, the starting point of good theory must be the intention to scientifically and rigorously test it (Wikström & Treiber, 2013), and "recognize and assimilate contrary evidence" (Tittle, 2004, p. 1642). Behind Popper's principle of falsification is the need for 'bold hypotheses'. These are hypotheses that have high empirical content and are therefore are easy to test and easy to refute (Popper 1934). This means that a theory must provide clear, precise and testable hypotheses in order to avoid developing crime prevention measures that have no causal efficacy.

1.3: Summary

The prevention and reduction of crime by young people is a key area for research, political debate and policy-making, however, arguably, there is little agreement about how best to tackle it. Knowledge about the causes of crime and evidence about what works to prevent young people's crime is arguably not adequate for informing effective policy and practice. Due to the immediate need for interventions, 'making do' with the best knowledge and evidence available can prove to be a stop-gap that exhibits some degree of success. However, poor prevention outcomes and iatrogenic effects show that 'making do' is not good enough as a long-term strategy. Criminologists should aim to advise practitioners as best they can with the current available knowledge, but not at the expense of building that knowledge in the longer term. The longer term challenge is to provide sound evidence about the causes of adolescent crime that can build knowledge in order to inform coherent policy and effective prevention efforts. The magnitude of the task of building the knowledge base means necessarily parcelling it up into manageable pieces, but a strong theoretical framework allows these pieces of evidence to fit together in a consistent whole.

We must continue to strive for knowledge about causes in order to prevent crime. This should be done by taking an analytical approach, within a strong theoretical framework.

> *"Advanced theoretical development in the study of crime causation is necessary if we want to improve our insight in the complexity of a social phenomenon such as crime, and if we want to develop prevention projects that allow for the reduction of crime by preventing its commission"*
>
> (Pauwels et al., 2009)

> *"We need to prioritize the study of the causes and explanations of crime and to put the problem of crime causation at the top of the crime prevention agenda. If we are to reduce significantly the problem of crime in society, we need advances in criminological theory and more sophisticated theory-testing to provide a stronger foundation for the development of effective crime prevention policies and interventions"*
>
> (Wikström, 2007b, p. 137)

> *"To intervene in these processes, we first need to better understand them. To better understand causal processes, we need an analytical criminology"*
>
> (Wikström & Treiber, 2013, p. 329)

> *"A well-developed and knowledge-based strategy (founded on an empirically-grounded theory of crime causation) would make it possible for policy-makers and practitioners to better focus their attention on the social, developmental and situational processes in which intervention can make the greatest impact in preventing or reducing crime and disorder."*
>
> (Wikström, 2007a, p. 75)

2 Situational Action Theory

> *"All of the simple theories of crime/deviance are defensible in their own terms, but also incomplete. They are limited in applicability, and even instances where a given theory logically applies to a particular criminal or deviant behaviour, the explanatory power of the theory is typically not very great. These theories leave too many questions unattended, and they neglect to connect the variables they deal with fully and logically. As a result, each of the simple theories leaves us intellectually unsatisfied and incapable of adequately explaining or predicting criminal behaviour"*
>
> (Tittle, 1995, pp. 15-16)

> *"P-O. Wikström… has constructed a criminological version of a theory of everything… His undoubted achievement is probably the closest the discipline will ever come to grand theory"*
>
> (Rock, 2017, p. 49)

This chapter proposes Situational Action Theory as the most effective and suitable theoretical framework for this thesis. It outlines the theory and provides definitions of some concepts that are crucial to later analyses and explanations. The models briefly introduced in this chapter are detailed in chapters 5 and 6 with reference to parental monitoring.

Chapter 1 argued that members of the public, media, economists and politicians (and also most individuals and institutions) agree that the reduction of crime is desirable; that knowledge about the causes of crime is the key to crime prevention strategies; and that building the knowledge-base about the causes of crime within a strong theoretical framework should be an essential task for criminologists in the pursuit of crime reduction. Criminology has produced a large number of diverse theories which fail in this task because they are fragmented and they suffer in at least one of the following ways; i) fail to clearly define crime, ii) lack a theory of action, iii) poorly integrate levels of explanation, and iv) fail to bridge macro and micro approaches; which results in their inability to explain crime (Wikström, 2006, 2010a, 2011, 2017; Wikström, Oberwittler, et al., 2012).[1]

Situational Action Theory (SAT; see, e.g., Wikström, 2006, 2010a, 2014, 2017) is a relatively new general theory of crime that is developing to address these problems of causation and explanation. Each discussed in turn in this chapter, SAT addresses these problems in four ways:

i) By clearly defining *crime* (as acts that break moral rules of conduct stated in law);
ii) by using a theory of *action* to explain acts of crime (by explaining what moves individuals to comply with or breach rules of conduct stated in law);

[1] See Tittle (1995) for additional discussion on problems with existing theories and features of adequate theory.

iii) by integrating individual and environmental levels of explanation (by outlining how individual characteristics and experiences of environmental features interact in the *situational* process of perception and choice that guides action);

iv) and by clearly distinguishing causes from the 'causes of the causes' (by addressing the role of broader social conditions and individual development).

SAT is a suitable guiding framework for this thesis because it addresses these problems of causation and explanation. Problems of causation and explanation plague the parental monitoring literature (this neglect of mechanisms is detailed further in chapter 5). Studies of relationships between various factors relevant to parental monitoring and behavioural outcomes commonly ignore or pay scant attention to the details of how and why these relationships exist, and what processes lie behind associations. Research findings from this literature involving a range of factors are contradictory, fragmented, confused, and unclear; and the many findings about their interrelationships are bewildering. By placing these factors within the framework of SAT, their role and interrelationship can be better understood and tested.

SAT's specific mechanisms are identifiable and testable. As a result, there is a growing body of empirical research that tests such mechanisms (for a summary, see, Pauwels, Svensson & Hirtenlehner, 2018, in press; Wikström, 2014).[2] As yet, there has been no specific application of SAT to the study of parental knowledge and parental supervision.[3]

SAT uniquely integrates individual and environmental explanations of crime; specifying a clear situational model by which this occurs. Traditional literature on parental monitoring primarily focuses on the role of parental monitoring in the individual development of young people's crime propensity, or on the importance of a lack of supervision for environmental explanations of crime (chapter 5). By applying the situational model of SAT to parental monitoring (chapter 6) and empirically testing it (part IV), this study will produce specific research findings about the situational role of supervision and parental knowledge that can be located within a broader framework of mechanisms explaining action.

[2] There are also studies that provide evidence in support of the central tenets of SAT without explicitly testing SAT itself (e.g., Kroneberg, Heintze, & Mehlkop, 2010)

[3] There has been some analysis of parental monitoring data by the Slovenian SPMAD study (Bertok & Meško, Forthcoming; Bertok, Wikström, Hardie, & Meško, 2012). SPMAD is a PADS+ affiliated study, set up with the aim of replicating parts of PADS+ and testing SAT. However, the correlational analysis between parental knowledge variables and substance use, theft and vandalism outcomes presented from SPMAD so far does not constitute a test of the core principles of SAT.

This chapter summarises the central constructs and propositions of Situational Action Theory, which are detailed in full elsewhere (e.g., Wikström, 2004, 2006, 2010a; Wikström, 2010b, 2014; Wikström, Oberwittler, et al., 2012, Chapter 1). The interaction of individuals and environment is at the heart of SAT and this is crucial to the situational focus of this thesis. This chapter (and section 2.3: in particular) contributes to SAT-led discussions about person-environment interaction by i) describing the historical theoretical and research context, ii) further clarifying and evidencing important distinctions, and iii) providing examples of and solutions to common misconceptions. The Situational model of SAT itself is described in further detail in chapter 6.

2.1: Defining crime

> *"Many criminological theories and empirical research studies fail to clearly define what it is they propose to explain, if they define it all"*
>
> (Wikström, 2017, p. 503)

> *"The most obvious and superficial way to define crime is to say that it is the violation of regulations of society. In advanced societies which have transcribed their rules of conduct into criminal law, crime is a violation of the code"*
>
> (Reckless, 1940, p. 8)

The discipline of criminology suffers because it does not have an accepted definition of crime and criminologists rarely start their explanations of crime with a clear, explicit, nor indeed any, definition of what crime actually is (Gottfredson & Hirschi, 1990; Wikström, 2006, 2010a; Wikström, Oberwittler, et al., 2012; Wikström & Treiber, 2007). The lack of a clear and established definition of crime is problematic for the study of the causes of crime because it makes any explanation ambiguous (Wikström, 2010a) and theories of crime may aim to explain different things (Akers, 1989, p. 25). Empirical assessment of the accuracy of the explanation becomes difficult, and it is therefore hard to compare completing theories to determine which is the most correct theory of crime (Wikström, 2017; Wikström, Oberwittler, et al., 2012).

Criminology needs a clear, logical and inclusive definition of crime to clear the ground of inconsistent and poorly integrated theory and empirical research in order to develop a sound understanding of the causes of crime and advance effective crime prevention strategies and policies. This definition must undermine theories inconsistent with it in order to allow for theory refutation which is essential to the advancement of scientific knowledge (Kuhn, 1962).

It is important to clearly define crime in order to understand the role of parental monitoring in crime because in order to understand the cause of something, we must be clear about the

'something' we are trying to explain (see further, Wikström, 2011; Wikström & Treiber, 2013). Studies of parental monitoring focus on a range of behavioural outcomes in addition to crime; such as substance use, anti-social behaviour, conduct disorder, crime, delinquency and association with deviant peers (for reviews, see, Crouter & Head, 2002; Dishion & McMahon, 1998). Since the mechanisms behind these behaviours are not necessarily the same, such studies and their findings cannot be directly compared. This thesis focuses on the role of parental monitoring in crime outcomes, using a definition of crime laid out by SAT.

Defining crime is the first task tackled by SAT, a task which - by definition - requires the identification of a distinguishing feature (essential quality) of all crime. SAT observes that all crimes are actions that are carried out by individuals or groups of individuals. However, the same act may or may or not constitute a crime depending on the individual actor, the jurisdiction, or its place in history (see also, Reckless, 1940). This is because crimes are defined by law, and they are also therefore infinitely diverse (Pease, 2002; Wikström, 2007b). A truly general theory of crime must tackle the ambitious task of explaining all acts of crime undertaken by all individuals, in all places, in all times. Some have questioned the possibility of this task (e.g., Reiss, 1991; Wilson & Herrnstein, 1985). However, this task becomes feasible by separating two key problems. Put simply, why certain acts become defined as acts of crime (why rules of conduct exist) is an important but fundamentally different question to why people break or follow rules of conduct (irrespective of what those rules are) (Wikström, Oberwittler, et al., 2012).

SAT is a general theory of crime because it aims to explain acts of crime by all individuals in all places in all times (Rock, 2017; Wikström, 2006). In order to do this SAT provides an explicit, unambiguous and fully inclusive definition of acts of crime. Ken Pease stated that "crimes are acts or omissions united only in their proscription by law" (2002, pp. 947-948); SAT takes an important further step by stating that crimes are also united by being moral actions.

2.1.1: Crime as moral action

> *"Crime should however be conceived of more than ever as a moral problem. A criminal event is a normative occurrence and whether rightly so or not, it is objectified in criminal law"*
>
> (Boutellier, 2000, p. xi).

> *"What constitutes a crime and what moves people to engage in acts of crime suggests that questions of personal morality and the moral context in which people operate should play a central role in the explanation of acts of crime"*
>
> (Wikström, 2010a, p. 211)

Crimes are actions and thus SAT is a theory of action. Specifically, SAT states that all acts of crime (in all places, in all times) can be distinguished from other acts because crimes by all individuals in all places at all times break a moral rule defined in law (see also, Reckless, 1940). (For further discussion of the definition of crime according to SAT, and the implications for understanding the causes of crime, see, e.g., Treiber, 2017b; Wikström, 2004, 2006, 2007b, 2010a, 2014; Wikström, Oberwittler, et al., 2012; Wikström & Treiber, 2013).

Central to SAT is that an act of crime is, specifically, a moral action – that is, an action that is guided by a moral rule (see also, Boutellier, 2000). Morality is often overlooked in criminology and has unfortunately been neglected by most criminologists (Bottoms, 2002; Boutellier, 2000; Tittle, 2007; Wikström, 2010a). SAT conceptualises morality as a set of value-based (moral) rules of conduct about what is the right or wrong thing to do (or not to do) in particular circumstances (Barton-Crosby, 2017; Wikström, 2014, p. 76; Wikström, Oberwittler, et al., 2012, p. 12). 'Morality' is a word that has been defined in many ways throughout history and philosophy (Barton-Crosby, 2017). It carries many connotations that can lead to assumptions about the concept. To avoid confusion it is important to stress that defining acts of crime as moral actions does not necessarily imply a moralistic approach: SAT does not prescribe what it is right or wrong to do (or not do) in certain circumstances, but addresses how such moral rules shape human action. In this sense, SAT conceives of moral rules as 'normative rules of conduct'. Such a conception does not involve virtue ethics.

> *"The question of why we have certain laws and common moral norms is a separate question from that of whether people's actions are essentially guided by their personal morals and the moral contexts in which they take part"*
>
> (Wikström, 2017, p. 502)

Whilst SAT makes no moralistic argument (about which actions are right and wrong), it states that both the content of and strength of feeling about moral rules is entirely relevant to whether (and to what extent) those rules are breached or adhered to (Wikström, 2010a). According to SAT, the strength of an individual's moral rules are reflected in the moral emotions (shame and guilt) they experience (and/ or anticipate experiencing) when breaching a particular moral rule. A person's morality is thus captured by both their moral rules and their moral emotions, for example, he or she may see two actions as wrong to do, but one as more reprehensible than the other. Further, a person's own views on whether an act should or should not be legally defined as a crime is of importance to actions of crime because a key reason why people may break the law is because they do not agree with (or do not care about) the moral rule that is defined in law. Personal moral rules are not the same as moral norms. For example, a person may smoke

marijuana even though it is illegal to do so because they believe that smoking marijuana should be legalised. Further, people may act contrary to the law because they (and others) view breaking that moral rule as an honourable or righteous act (e.g., politically motivated crime or gang crimes). Again, SAT is not moralistic: "the theory does not imply that people who break a particular law are amoral, only that their views on what is right or wrong may differ from that particular law or that they may care less about adhering to that particular law" (Wikström, 2014, p. 77).

Further, at a societal level, moral rules may generally be seen as reprehensible to varying degrees, and this strength of general feeling about a moral rule is relevant to whether an individual person complies with or breaches that moral rule (e.g., breaching a moral rule that is generally strongly cared about is more likely to attract negative attention than breaching a rule that few care strongly about) (see also, Elster, 1989). There are some actions that are generally regarded as wrong by people in many places throughout history (Bottoms, 2002; Elster, 1989).[4] Such universality prompts Wikström to suggest that shared moral rules are somehow related to human nature and may form the basis of social order (2010a). SAT therefore also refutes the argument that any moral rule is as likely to emerge as any other (thus rejecting moral relativism).

All legal rules are moral rules, but not all moral rules are legal rules, i.e., moral rules are not all defined in law. As a key mode of social engineering that prescribes what it is right or wrong for people to do, the law contains much moral content. However, there are many moral rules that are not regulated by law and therefore crime is a special case (subset) of moral rule breaking. Therefore the explanatory process of explaining acts of crime is the same as explaining breaches of moral rules in general.

By defining crime as moral action in this way, a theory of crime causation becomes a special case of a more general theory of moral action (Wikström, 2017). Studies of the causes of crime must explain why people comply with or breach rules of conduct (stated in law). For SAT, explaining acts of crime does not require an explanation of the particular behaviour itself, but, specifically, why a person engaged in this activity when it is illegal to do so. The explanatory process is therefore the same for explaining all types of crime; it is the content of the process (i.e., the action-relevant moral rules that guide the process) that differs. Hence, SAT is applicable to all

[4] Although Reckless argues that 'natural crimes' (i.e., universal crimes) do not exist (Reckless, 1940), anthropologists have found rules concerning sexual behaviour and, in particular, incest, to be universal to human society (Harris, 1997, pp.250, 253; Rosman, Rubel, & Weisgrau, 2009, p. 101).

types of crime (and moral rule-breaking), by all people, at all times. This includes behaviour that is often termed 'anti-social behaviour' or 'delinquency'.[5]

By using this definition of crime, an explanation of crime involving parental knowledge and parental supervision is also applicable to an explanation of moral rule-breaking in general. This means many kinds of behavioural outcomes may also be explained using the theoretical framework and empirical evidence presented in this thesis. This includes behaviours addressed in the parental monitoring literature, including many examples of anti-social behaviour, delinquency, conduct-disorder, and substance use.

2.2: A theory of action

> *"People are the source of their actions because they have agency, i.e., powers to make things happen intentionally"*
>
> (Wikström & Treiber, 2013, p. 322)

All acts of crime are actions and people are the source of their actions (Wikström, 2004).[6] The definition of a cause is something (e.g., person or thing) that gives rise to or produces something else (e.g., action, phenomena, condition), so to explain acts of crime requires an understanding of the processes (mechanisms) that produce the act (see, Wikström (2011), and section 1.2.1:). In other words, any theory about the causes of crime must necessarily be a theory of what moves people to act, i.e., a theory of action. Despite this, most theories of crime lack any developed theory of action and instead are probabilistic theories of propensity (Bruinsma, 2016; Wikström, 2004, 2006). The lack of specification of the process by which action occurs results in the failing of most theories to fully explain crime, in particular, the relationship between factors such as parental monitoring and crime (for examples, see chapter 5).

"Humans are rule-guided actors" (Wikström, 2010a, p. 217), as opposed to self interested actors.[7] Human brains operate using neurological heuristics which are rules that guide decision-making (S. A. Bunge & Wallis, 2008; Treiber, 2011). Similarly, social and cultural rules also guide

[5] This is not to say that it becomes clear for every act as to whether it is 'delinquent' or not. For example, the Crime and Disorder Act (1998) defines anti-social behaviour (ASB) as 'acting in a manner that caused or was likely to cause harassment, alarm or distress to one or more persons not of the same household as (the defendant)', which means it is fundamentally subjective in nature and therefore difficult to operationalise (Ashworth et al., 1998; Burney, 2005; Harradine, Kodz, Lemetti, & Jones, 2004; Matheson, 2011; Millie, 2008; Nixon, Blandy, Hunter, Jones, & Reeve, 2003).

[6] An interactive world view is implicit in this statement, see section 1.2.1.1:.

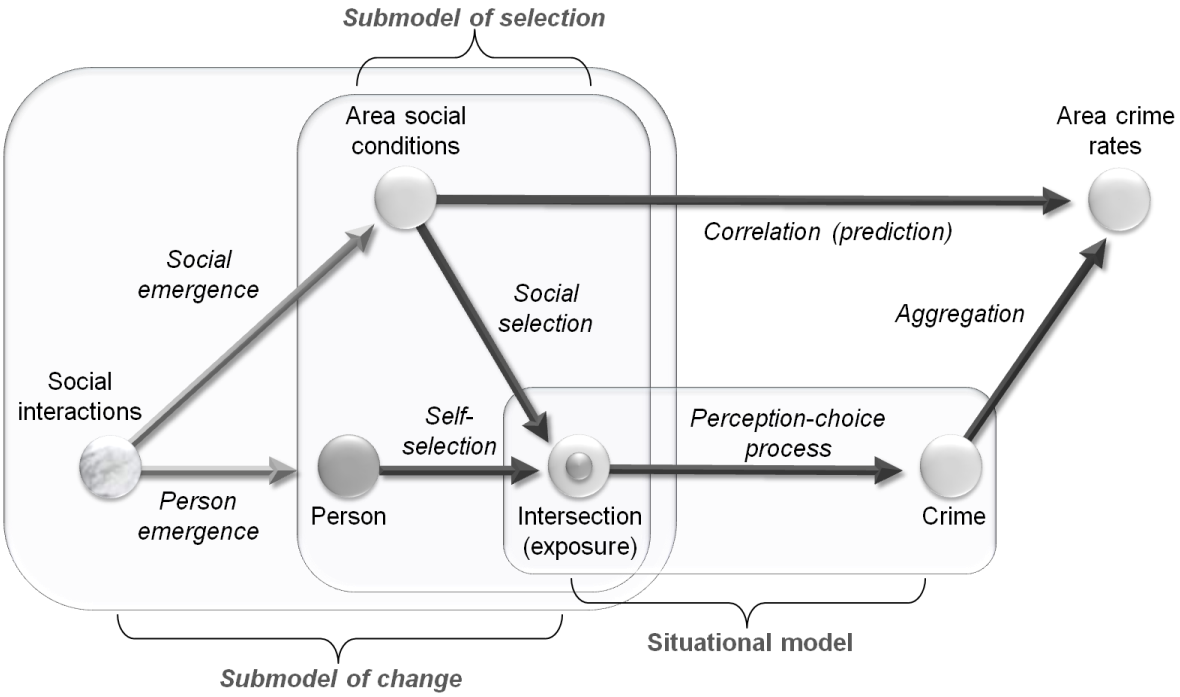
[7] In contrast to SAT's fundamental assumption of human nature as rule guided, many crime theorists such as those who focus on control (Briar & Piliavin, 1965; Gottfredson & Hirschi, 1990; Hechter, 1987; Hirschi, 1969; Nye, 1958; Reckless, 1940; Reiss, 1951) or opportunity (Clarke & Cornish, 1985; Cohen & Felson, 1979; Felson, 1994; Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996; Wilcox, Land, & Hunt, 2003) argue that humans act in their own self interest. See further section 5.1.1.1:.

action - consider all the everyday actions one need not deliberate over due to existing rules that guide our behaviour. For example, getting dressed, meeting someone for the first time, queuing, driving, buying lunch and playing sports are all actions that are largely guided by behavioural rules. The very construction of human society and culture would not be possible without shared rules to guide the actions of people (see also anthropological writings, e.g., Fortes, 1983). Though rationality and self-interest can play a role, SAT states that human action is proactive in that it is driven by rules which negate the need to weigh up (react to) consequences such as costs, benefits, pleasure, or pain.

SAT is a theory of action that provides an analytical framework to explain crime involvement from both a situational perspective at the point of action, and from an eco-developmental perspective leading up to the action. These perspectives and their proposed causal mechanisms are captured in two SAT models; the situational model, and the social model (outlined in sections 2.3: and 2.4:. The situational model is detailed with reference to parental monitoring in chapter 6). The full model of Wikström's SAT shown in Figure 1 subsumes the situational model, and two sub-models of change and selection (Treiber, 2017b).[8] This figure highlights how SAT places the intersection of individual and environment at the centre of the explanation of crime. In this context, SAT defines a situation as a perception-choice process initiated by a person-setting interaction (Wikström, 2006; Wikström & Treiber, 2016a) and argues that the causes of action are situational, and social factors implicated in crime involvement are best understood as 'causes of the causes'. These models are introduced in the following sections.

[8] The basis of this figure was first used to depict SAT by Wikström (2011). It was inspired by 'boat' diagrams developed to depict macro-micro relations by social theorists Coleman (1986, 1990) and Boudon (1986).

Figure 1: SAT's social, situational and sub- models of crime causation



Source: Treiber (2017b)

2.3: Integrating individual and environmental levels of explanation: The situational approach to explaining crime

> *"Every scientific psychology must take into account whole situations, i.e., the state of both person and environment"*
>
> (Lewin, 1936, p. 12)

> *"Situational theories of crime focus on explaining why crime events happen. They pay particular attention to the explication of how interactions between people and environments move people to engage in acts of crime. They can be distinguished from individual and developmental theories (which focus on why people come to have certain and varying crime propensities) and environmental theories (which focus on why environments come to have certain and varying criminogenic inducements)"*
>
> (Wikström & Treiber, 2016a, p. 415)

> *"The interactional view of behaviour seems to be a natural next step in theory and research"*
>
> (Magnusson & Endler, 1977a, p. 31)

2.3.1: Integration

In 1940, Walter Reckless stated that criminology is "not a unified body of knowledge but rather a reservoir of diverse insights and, to a large extent, of unintegrated conclusions" (1940, p. 1). Specifically, it has long been acknowledged that a key problem in criminological research is the separation of critical insights from polarised traditions that are oriented toward the individual and environment respectively. For example, 1950 Sheldon and Eleanor Glueck stated that "proponents of various theories of causation still too often insist that the truth is to be found only in their own special fields of study" (Glueck & Glueck, 1950, p. 4) and this "major theoretical issue" was referred to by West and Farrington 40 years ago as "the controversy between the psychological and sociological orientations" (1973, p. 200) (see also, Rodman & Grams, 1967). These researchers go on to stress the importance of a multi-causal, cross-disciplinary theoretical approach for understanding human behaviour including crime. Researchers have continued to state the need to integrate individual (micro) and ecological (macro) approaches (Farrington, Sampson, & Wikström, 1993; Jensen & Akers, 2003; Le Blanc, 1997; Liska, Krohn, & Messner, 1989; Reiss, 1986; Tittle, 1995; Tonry, Ohlin, & Farrington, 2012; Wikström, 2005, 2017; Wikström, Clarke, & McCord, 1995; Wikström, Oberwittler, et al., 2012; Wikström & Treiber, 2016a). Criminology is not alone in recognising the limitations of a schism between individual and environmental approaches to theory and research. Academics from a range of fields have long since written about the need for integration (for examples or discussion, see, Anastasi, 1958; Belsky & Pluess, 2009; Carmichael, 1925; Cronbach, 1957; Darwin, 1859; Dodge & Rutter, 2011; Ekehammar, 1974; Fuentes, 2016; Kantor, 1924; Lewin, 1936; Overton, 1973; Piaget, 1971; Sullivan, 1953).

Despite consensus in many disciplines regarding fragmentation, conceptions of generally and specifically how integration of individual and environmental approaches to theory and research may, or should, be achieved are vast and varied (and often absent). In general terms these conceptions of integration are based on one of two world views. One of these world views assumes that components (individual and environmental) are additive, the other, interactive (see section 1.2.1.1:). [9, 10] Section 1.2: argued strongly that questions of which factors have influence,

[9] These worldviews also contribute to the fragmentation of approaches described above.

[10] There follows an illustration of the difference between the additive and interactive approaches to the integration of individual and environmental insights. Reckless rightly argued that 'differential response to exposure' meant that a 'self factor' was lacking from (sociological) theories of crime that focused on environmental factors. He asks "what is the difference between those who are and those who are not affected? What sorts of individuals are they who succumb and what sorts are they who remain immune?" (Reckless, 1940, p. 444). However, by asking *what* the individual differences are (as opposed to *how* that difference means that the individual responds to the environment differently) belies an additive approach to the integration of person- and environment- oriented understandings of the causes of crime. The various research studies into the 'self factor' that Reckless goes on the present are guided

and how much relative influence each factor has (raised by an additive, predictive approach), are not enough for effective crime prevention. Alternatively, the interactive world view states that the component (individual and environmental) parts of behaviour cannot be decomposed, raising questions surrounding *how* they interact (including what specific conditions of components are relevant and which processes are involved). This 'how' question can be specifically theorised and empirically investigated (see further, Anastasi, 1958; Overton, 1973; Overton & Reese, 1973). This thesis seeks answers to the 'how' questions by taking an analytical and explanatory approach to the study of crime and to crime prevention, and therefore sits very firmly within the interactive paradigm.

Both individual and environmental approaches help identify important factors. In isolation or in sum, these approaches are unable to explain human action (such as crime) - they can only predict. Prediction has limited value for effective crime prevention, which instead requires an analytical approach that aims to explain acts of crime (see section 1.2:). Explanation of the specifics of *how* a person and settings are linked in an act of crime requires an interactive world view.

2.3.2: Interaction

Different meanings of the term 'interaction' have been (often implicitly) applied when theorising about or empirically studying individual-environment interaction (for examples, see, Ekehammar, 1974; Kantor, 1924; Lewin, 1936; Mischel, 1977; Overton & Reese, 1973; Wikström, Oberwittler, et al., 2012; Wikström & Treiber, 2016a). Olweus (1977) classified these meanings into four kinds. The first meaning refers to a general sense in which individuals and environments 'combine' or 'connect' in evoking behaviour, but does not specify the nature of this interaction. The second meaning is reciprocal action, also known as 'transaction' or 'dynamic interaction', and this relates more to ongoing and even long term processes of change and development than to situational processes of individual-environment interaction of interest in this thesis.[11] These first two meanings of 'interaction' are not relevant for this discussion due to the (respectively) general and specific sense of them. Olweus (1977) states that the third and fourth meanings of 'interaction' are incompatible. The third meaning of 'interaction' refers to mutual interdependency (i.e., inseparability of individual and environment as per Lewin (1936)

by these 'what' questions and therefore this research becomes a search for the nature and strength of this 'self factor', and the original conception of it being the key to the differential response to exposure is lost. The (interactive) mechanism by which the person factor influences the differential response to exposure is neglected.

[11] As well as behavioural outcomes, the traditional interactionist position has also been used to study individual development over time (Ekehammar, 1974; Overton, 1973; Overton & Reese, 1973; Wachtel, 1977). For discussion of continually occurring moment-to-moment interchange, see, Fiske (1977).

and SAT (e.g., Wikström & Treiber, 2016a)). This can be called *situational interaction*. The fourth means 'interaction' as assessed statistically by comparison of the relative magnitude of the person-environment interaction to the magnitude of the main effects of the component parts (see, Ekehammar, 1974). These assessments are traditionally conducted using regression models and independent data and can be called *statistical interaction* (see chapter 7). These latter two conceptions of 'interaction' are incompatible due to the incompatible (additive or interactive) worldviews on which they are based (see also section 1.2.1.1: and Overton and Reese (1973)), and the structure of the data that they demand (Wikström, Mann, & Hardie, 2018, in press); yet this incompatibility is rarely acknowledged (see further chapter 7).

Recognition of the importance of person-environment interaction is not new to theories of human action (for a historical review, see, for example, Ekehammar, 1974).[12] Ninety years ago, Jacob Robert Kantor wrote that "no biological fact may be considered as anything but the mutual interaction of the organism and the environment" (Kantor, 1924, p. 369). Independently ten years later, Kurt Lewin argued that a situation emerges from the person-environment interaction, and that this interaction inherent in situations explains action (1936). The influence of Lewin's field theory led to him being widely accepted as the father of social psychology (for a discussion of Lewinian theory and its impact, see Burnes & Cooke, 2013; Ekehammar, 1974; Jones, 1985; Kihlstrom, 2013). Lewin's theory represented a departure from traditional explanations of behaviour that were rooted in the past; giving a new importance to a person's momentary interaction with the features and circumstances of their environment. In the late 1960's ecological discussions of person-environment relations boomed (for a discussion, see, Jordan, 1972; Mischel, 1977), and by the late 1970's, research into interactional psychology had put the study of personality 'at the crossroads' (Magnusson & Endler, 1977b).[13]

Despite their importance to much that came after, classical conceptions (such as that of Lewin and Kantor, see also, H. A. Murray, 1938) did not adequately specify the details of the situational processes (mechanisms) involved in the relationship between individuals and their environment, and how that interaction results in a particular action. Magnusson and Endler state that "such an integrating model is essential in order to describe and explain the *process* of what we have called dynamic interaction" (1977a, p. 22 original emphasis). They, and the individual contributors to their symposium (and volume) on the state of the interactional psychology discipline (1977b)

[12] Though the distinction between situational and statistical interaction is not always recognised or apparent.
[13] The field of Interactional Psychology is a collective response to the extremes and polarisation of personologism and situationism in personality research and aims to scientifically study the complex interplay of persons and environments (which are often referred to as situations – see the following section) in determining behaviour (Ekehammar, 1974; Magnusson & Endler, 1977a; Mischel, 2004).

made a range of suggestions for future endeavours including the need for both empirical research capturing interactions, and a model of behaviour. Just as Bronfenbrenner's ecological approach changed the study of human development (e.g., 1979), the major important contribution to the study of human action by researchers such as Magnusson and Endler was to emphasise that humans do not act in a vacuum (e.g., Magnusson & Endler, 1977a). However, the theoretical formulations and empirical study they advocated were only partway successful in explicating the specifics of *how* person-environment interaction occurs.

Even prior to Magnusson and Endler's symposium, it was long recognised that a major challenge for the empirical study of person-environment interaction was to accurately and usefully describe and classify environments (for a discussion, see, Ekehammar, 1974). Although presented from different perspectives in different times it is clear that one important way to classify environments is to distinguish between the physical environment and the psychological environment (e.g., Kantor, 1924; Koffka, 1935; Magnusson, 1971; H. A. Murray, 1938; Pervin, 1968). As Ekehammar's historical review summarises: "although the terminology is different, the common main idea is that the individual's psychological representation and construction of the environment is emphasized" (1974, p. 1044). Magnusson in particular stressed the importance of the perceptual environment over the actual (physical)(e.g., 1971).

Irrespective of attention to the challenge of classifying environments, the challenge of specifying the mechanisms by which individuals interact with those environments still remained. Mischel stated that when rejecting simple trait-based personality research in favour of that which recognises the importance of environments "it is important to avoid emerging simply with a trait psychology of situations, in which events and settings, rather than people, are merely given different labels. The task of naming situations cannot substitute for the job of analyzing *how* conditions and environments interact with the people in them" (Mischel, 1977, p. 338 original emphasis). Despite much research into the environmental conditions and personal traits involved, arguably the interactional psychology field has not yet fully specified a detailed and specific model of the mechanisms that explain how their interaction explains behaviour. Whilst some promising developments have been made;[14] the specifics are frustratingly absent.

[14] Collectively, this research field seems to imply that the process (e.g., social cognition) is based in the individual, but the content and motivation vary situationally (see, e.g., Argyle, 1977; Kihlstrom, 2013; Mischel, 1973, 2004), but the proposed processes are not made clear. For example, in advocating a cognitive social learning approach to interactional psychology, Mischel (1973) draws attention to a range of variable individual features (e.g., selective attention, expectation of consequences, subjective value of consequences, social rules, self-regulation, cognitive ability, empathy), and states that environments can have (differential) influence on these person-level variables. He also states that individuals can select and modify their environments. Consistent with an action theory, Mischel also

This lack of a specific model of person environment interaction is due in part perhaps to a continued preoccupation with prediction, which draws attention away from the need for explanation and therefore strong theory. It is also perhaps due to methodological limitations of interaction studies (see, e.g., Ekehammar, 1974; Mischel, 1977; Mischel, 2004) which are also discussed in chapter 7; and relatedly, the different conceptions of 'interaction' discussed above. Arguably though, a fundamental but common misconception has also hindered this process. By naming an individual's perception of their physical environment the 'psychological environment', the literature has conflated the distinct concepts of perception and environment. Perception is an individual's cognitive representation of and response to their environment. As such, processes of perception are themselves interactive processes. The conflation of perception and environment in this literature is evident in Ekehammar's summary of various empirical conclusions: "individuals construe or perceive the same environment differently. This means that the psychological environment may be different for different individuals" (Ekehammar, 1974, p. 1034). Individuals' differential perception of the physical environment came to the fore in interactional research; however, it was implicitly understood as part of the environment and not a feature of the interaction itself. This is unfortunate because as is made clear in section 5.3:, differential perception is crucial to the interaction process recognised by SAT.

2.3.3: Confusion of 'situation' with 'environment'

> *"…effort has been made to indicate how the situational factors are conducive to crime and delinquency. Such factors have often been referred to as environmental factors"*
>
> (Reckless, 1940, p. 220)

> *"The term situation is generally used to refer to the environment in which a person acts, ignoring the fact that different people respond differently to the same environment and hence that the same environment represents different situations for different people"*
>
> (Wikström & Treiber, 2013, p. 232)

It is possible that this conflation of perception and environment is also the reason behind a puzzling and frustrating shift in semantics in the interactionist literature. Lewin very clearly specified that situations are comprised of the states of both individuals and the environments they are in, and that actions arise from situations i.e., $B = f(P, E)$ (1936). He states:

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states the importance of assessing what people do rather than generalising about what they are like. All of these features, processes, and interactions are important in SAT. Unlike in SAT, the roles and specific mechanisms of these features and processes are not fully developed and are not integrated in a wider theoretical framework. This is still the case in modern interactionist psychology (e.g., Kihlstrom, 2013; Mischel, 2004)

> *"If one represents behaviour…by B and the whole situation including the person by S, then B may be treated as a function of S: B = f(S)…In psychology one can begin to describe the whole situation by roughly distinguishing the person (P) and his environment (E)"*
>
> (Lewin, 1936, p. 12).

A Lewinian definition clearly determines that situations comprise individuals (in environments); whilst individuals are distinct from environments. Despite the clear implications of Lewin's equation, most references to interactional psychology, even those founded on and directly referring to Lewinian principles, refer to person-*situation* interaction, not person-*environment* interaction. For example, it is common for researchers to discuss features of individuals and features of environments, and then talk of P x S (person-situation) interaction as opposed to P x E (person-environment) interaction as Lewin originally intended (e.g., Cooper & Withey, 2009; Kihlstrom, 2013; Magnusson & Endler, 1977b; Mischel, 2004).[15] Arguably, by 'situation' these interactional psychology researchers mean 'environment'. This confusion of terminology is possibly due to the aforementioned unfortunate conflation of the concepts of environment and perception; at which point the term 'environment' alone was no longer adequate to capture what was meant. This is perhaps evidenced by this statement by Magnusson and Endler about the focus of the interactionist model of personality "on the ongoing multi-directional interaction between an individual and his or her environment, especially the situations in which behaviour occurs" (1977a, p. 4).

Regardless of the root of the misuse of these words, frustratingly, the common use of the term 'person-situation interaction' in interactional psychology adds to general confusion and conflation of the terms 'environment' and 'situation' in other fields. Many theorists and researchers throughout social research refer to situations when arguably they really mean environments or settings (see also, Wikström & Treiber, 2016a). For example, in Criminology, the Gluecks refer to the act of delinquency as a "personal-situational phenomenon" (Glueck & Glueck, 1962, p. 163), and in Sociology, Brittain's 'situation hypothesis' refers to situations as a "still life picture of the structure of an individual's social space" (Larson, 1972, p. 67).

Furthermore, the words environment, setting and situation are specifically and explicitly presented as being interchangeable in interactional psychology (e.g., Argyle, 1977; Ekehammar, 1974; Kihlstrom, 2013; Magnusson & Endler, 1977a; Mischel, 2004; Olweus, 1977). This is also common in other fields, such as criminology. For example, 'Situational Crime Prevention' refers

[15] Mischel (1977) concluded that 'strong' situations exert more influence on individuals than 'weak' ones. Since he states that strong situations constrain options for individuals and give clear signals to them about what expected, it is arguable that by situation, he is really referring to environments, settings or contexts. In this case, if a reader were to replace the word 'situation' with 'environment' or 'context', Mischel's findings would be very much in line with SAT.

to intervention measures that target opportunities and conditions in settings and environments while steadfastly ignoring the individual (Cornish & Clarke, 2003).

For SAT, the terms environment and setting are often used interchangeably, but actually have distinct meanings. Whilst environment refers to everything that is external to the person, a setting is the "part of the environment to which the individual is directly exposed and reacts; configuration of objects, persons and events accessible to the person through his or her senses" (Wikström, 2010a, p. 219). This means that whilst an environment exists independently of actors, a setting is defined by the presence of an actor. Features of settings therefore include features, circumstances and conditions such as supervision, time of day, and any media present.

The work of Briar and Piliavin (1965) provides a prominent example of the use of the term 'situation' in place of 'environment' or 'setting' that has had far-reaching implications in 'situational' criminological theory and research. Their influential concept of 'situational motivation', is motivation that is short term, but "experienced by all boys" (Briar & Piliavin, 1965, p. 36).[16] This conception of motivation does not allow for variation between individuals in response to their environment which means that the concept should, in fact, be called 'environmental motivation' or 'setting motivation'. This is at odds with SAT's concept of motivation (see section 6.2.1:) as being rooted in the interaction of individual and environment (i.e., in true Lewinian/SAT situations). A problem with Briar and Piliavin's use of the word 'situation' in the place of 'environment' is that this imprecision is mirrored in ideas and concepts that build on their work. Briar and Piliavin's (1965) definition has influenced much work on the impact of environments and contexts on behaviour that has been conducted within the rational choice, routine activity and environmental criminology approaches (e.g., Brantingham & Brantingham, 1993; Hoeben, 2016; Janssen, 2015; Osgood et al., 1996), For example, Osgood et al.'s influential individual level perspective on crime states that "a central concept for our analysis is Briar and Piliavin's (1965) idea of situational motivation, which states that the motivation for delinquency is inherent in the situation rather than in the person" (Osgood et al., 1996, p. 638). Osgood et al. actually state that they "do not assume that everyone is equally receptive" (p. 639)

[16] It is unclear from their definition of situation whether Briar and Piliavin (1965) fully subscribe to an Lewinian/SAT definition of situation. It is also unclear from the work of Kohn and Williams (1956), from whom Briar and Piliavin state that their definition is borrowed. However, arguably their conception of situation is different from that of Lewin and SAT. Not least of course this is because Briar and Piliavin's conception of 'situational motivation' is inconsistent with Lewin and SAT, but ultimately this is perhaps because the conceptualisations and discussions by both Briar and Piliavin, and Kohn and Williams refer to situations in lay terms. Lay conceptions of situations implicitly assume person-environment interaction, however, this interaction is referred to in general terms (see Olweus' (1977) first definition of 'interaction' as 'combine' or 'connect', section 3.3.2), as opposed to a closely specified Lewinian or SAT conception of interaction as mutual interdependency (Olweus' (1977) third definition of 'interaction').

to environmental inducements, however, their mechanisms by which this may occur are absent from their theory and their empirical analysis ignores such individual differences and focuses solely on features and circumstances of the environments to which individuals are exposed. Osgood et al. refer to their approach as a 'situational explanation of crime', when it is actually a description of environmental inducements to crime (criminogenic settings) (see further, section 5.3.1.1:).

This conflation of situation and environment has had continued impact on criminological research. True situational research (i.e., which studies the outcome of person-environment interaction) is less common than the use of the term 'situational' in research would suggest because of studies that purport to research situational effects when they actually study environmental effects. For example, some recent criminological studies that are ultimately rooted in the routine activity perspective and influenced by Osgood et al. (1996) self-define as 'situational'. However, the analyses either do not analyse individual differences or statistically hold them constant and therefore cannot, by a Lewinian/SAT definition, study situational effects (Anderson & Hughes, 2008; Averdijk & Bernasco, 2014; Bernasco, Ruiter, Bruinsma, Pauwels, & Weerman, 2013; Hoeben & Weerman, 2013). Instead they study the independent (of individual differences) effects of environmental features and conditions (see further, chapter 7).

It is important to differentiate the Lewinian situational approach (for example, that of SAT) from others that confuse the term situation to mean immediate environment, which is typically independent of the person acting within it (for some existing discussion, see, Wikström & Treiber, 2016a). Why does the conflation of environment and situation matter? The problem with this confusion of terms is that conceptually, situations and environments are not the same, and this has implications for theory, measurement, and analysis. The above examples all assume that an individual is distinct from the situation. However, situations always *comprise* a person (interacting with an environment). An environment still exists when a person leaves it, whereas a situation is dependent on both the environment and the individual in it (experiencing it, responding to it and acting in it). Ekehammar describes Lewin's position: "the situation was conceptualised as a whole, which also involved the individual. Thus, the components in the organism-environment system were not regarded as independent elements but as mutually dependent" (Ekehammar, 1974, pp. 1028-1029). Although in some cases this is purely a semantic issue, unfortunately the conceptual confusion over 'environment' and 'situation' has important consequences for the kinds of theories, approaches, analysis and even crime prevention initiatives which are then termed 'situational' (see further, section 5.3: and chapters 6 and 7).

2.3.4: SAT's situational approach to explaining acts of crime

> *"People commit acts of crime because they find them acceptable in the circumstances (and there is no relevant and strong enough deterrent) or that they fail to act in accordance with their own personal morals (i.e., fail to exercise self-control) in circumstances when externally pressured to act otherwise"*
>
> (Wikström, 2017, p. 502)

> *"Almost all behaviour, including moral behaviour, is a function of the interaction between the characteristics of the individual… and features of the specific situation or circumstance"*
>
> (Eisenberg & Mussen, 1989, p. 140)

> *"According to SAT a situation is the result of a particular person's engagement with a particular environment"*
>
> (Wikström & Treiber, 2013, p. 323)

What to do about the widely acknowledged fragmentation in criminology specifically? Despite repeated calls for integration of the individual and ecological approaches to the study of crime, little progress has been made (for discussion, see, Bunge, 2006; Wikström, Oberwittler, et al., 2012; Wikström & Sampson, 2006). Most crime research and theories of crime causation focus on the role of either personal or environmental factors. A few theories acknowledge the importance of the other factor (e.g., Felson, 2002; Gottfredson & Hirschi, 1990), but provide no substantive detail as to the mechanism by which an integration of the two levels of explanation occurs (for examples and detail, see, Wikström, 2010a, p. 215; Wikström, Oberwittler, et al., 2012, pp. 4-6; Wikström & Treiber, 2007, pp. 239-240; 2016a, pp. 418-428). For example, Cohen and Felson's Routine Activity Theory (1979) specifies the necessary conditions (of both person and environment) for crime to occur but does not specify *how* this convergence causes the action. In the risk factor tradition, while both individual and environmental risk factors may be deemed to carry predictive power, these risk factors are treated as separate components by being integrated in a purely additive sense and therefore the question of *how* this integration occurs is largely left unasked.

More than a decade ago, Wikström (2005) asserted that promising movements towards linking both ecological and individual propensity theories to action theory were yet to make any substantive arguments for how these theories may be integrated, but that his newly developed Situational Action Theory achieves this integration. SAT is a theory with interaction at its heart. SAT provides an empirically testable situational model that explains how (by which mechanisms) personal and environmental factors interact to influence people to follow or breach rules of conduct, in response to motivations. Very few other criminological theories to date integrate personal and environmental factors by detailing *how* their interplay affects acts of crime. One

notable example is the Social Schematic Theory of crime (SST; Simons & Burt, 2011; Simons, Burt, Barr, Lei, & Stewart, 2014) but SST is conceptually less specific than SAT.[17] Outside criminology, the well-specified Model of Frame Selection (MFS; Esser, 2009; Esser & Kroneberg, 2015; Kroneberg, 2014) is an integrative model of action that has been applied to acts of crime and moral rule-breaking (Beier, 2017; Kroneberg et al., 2010).[18] In comparison to MFS and SST, SAT has been more extensively applied and empirically tested within criminology. SAT has also been tested in a wider range of contexts and nations, often with a range of more innovative methodologies. Crucially in terms of its suitablity as a guiding theoretical framework, SAT is also arguably currently more elaborately specified than any other theory that attempts to integrate individual and environmental explanations of crime.

A crucial proposition of SAT is that the influence of individual and environmental factors on acts of crime cannot be independent. Environments cannot act. Individuals act, but they act in response to the environment they are experiencing (setting) such that characteristics of individuals and features of settings in which they take part interact to influence action such as acts of crime (see also, Bunge, 2006). In short, features of individuals or environments alone are not sufficient to cause action; it is through their interaction that they are activated (see further, Wikström & Treiber, 2016a).

A situational analysis of crime is one that explicates which *intersections* of particular personal and environmental factors (i.e., interactions) initiate which action mechanisms leading to an act of

[17] SST's concept of 'criminogenic situational definitions' blurs the distinctions clearly made by SAT between motivation, perception, and choice. The measure of 'criminogenic situational definitions' used by Simons et. al. captures both opportunity present in the setting and the individual's perception of action alternatives, but cannot separate them (e.g., "When you are out and about, how often do you encounter situations where you become aware that there is an opportunity to help yourself at some sucker's expense?" (Simons et al., 2014, p. 670). A further example of SST blurring distictions made by SAT is that the 'criminogenic schemas' of SST combine elements of poor self control ('immediate gratification') and weak morality ('disengagement from conventional norms') (Simons et al., 2014, p. 669), when the specific and interacting role of these have been clearly demonstrated in empirical studies testing SAT (Antonaccio & Tittle, 2008; Svensson, Pauwels, & Weerman, 2010; Wikström, Oberwittler, et al., 2012; Wikström & Svensson, 2010). Further, according to SST, 'criminogenic schemas' include 'hostile views of relationships' (Simons et al., 2014, p. 669), which is again a distinct element of SAT's conception of the action process (i.e., plays a role in motivation by influencing sensitivity to provocation). Additionally, SAT (and associated empirical evidence) provides a more convincing and specific account of the (conditional) relevance of both internal and external controls (such as self control and deterrence) than does SST (Antonaccio & Tittle, 2008; Hirtenlehner & Hardie, 2016; Kroneberg et al., 2010; Svensson, 2013; Svensson et al., 2010; Wikström & Svensson, 2010; Wikström & Treiber, 2007; Wikström, Tseloni, & Karlis, 2011; Zimmerman, Botchkovar, Antonaccio, & Hughes, 2015).

[18] Although there is no specific comparison of these recent theories in the literature, Treiber does make some discussion of MFS's 'script selection' with reference to SAT's model of criminal decision-making (Treiber, 2017a). Ultimately, despite some differences (which may be drawn upon usefully when working within either framework), MFS and SAT have generally identical implications for many research questions, and have even been treated as a single theoretical framework (e.g., Beier, 2017). The implications of MFS for the study of the situational role of parental monitoring factors in acts of crime will not be addressed in this thesis, though present a potentially fruitful future challenge.

crime. Figure 1 (on page 65) shows that the intersection of person and environment is at the heart of the social, situational and sub-models of SAT. For SAT, the situation is "neither the person (his or her traits and state) nor the immediate environment (its characteristics and state) but the motivations and perception of action alternatives that arise from their particular combination" (Wikström & Treiber, 2016a). Thus, it is the particular combination of personal and environmental features of people and the settings they are in that bring about the crime event. Action (e.g., crime) is explained by a person-environment interaction. This PEA hypothesis ($P \times E \rightarrow A$) is at the centre of SAT's situational model for the explanation of action (including acts of crime).

> *"For any particular motivation (temptation or provocation), the resulting action (A) is an outcome of a perception-choice process (→) that results from the interaction (x) between relevant personal propensities (P) and exposure to relevant setting inducements (E)"*
>
> (Wikström & Treiber, 2016a, p. 430)

SAT states that particular aspects of individuals and settings are relevant for action (e.g., crime). The exposure of particular individuals to particular environments gives rise to particular situations. SAT defines a situation as a perception-choice process initiated by a person-setting interaction (Wikström, 2006; Wikström & Treiber, 2016a). The outcome of the perception choice process is action. The specifics of this situational process are described in section 5.3.2: and chapter 6.

2.3.5: Summary

Situations, under the specific definition intended by Lewin and Wikström, are rarely acknowledged as the critical feature of action. This means that usually any integration of individual and environmental factors in explaining crime is of an additive rather than interactive nature. Situational processes are therefore under-researched, making them an ideal candidate for in-depth study. Therefore, the focus of this thesis is on situational processes. Description of SAT's situational model is integrated with specific discussion of the role of parental monitoring in this model in chapter 6. Chapter 7 describes the specifics of the situational analytical approach and chapter 8 describes the situational data collection methods used.

2.4: Distinguishing causes from the 'causes of the causes': The social model of selection and change

> *"Differences in people's crime involvement depends on processes of social and self selection that place some people in criminogenic settings more often than others, and processes of emergence that make some people more crime prone than others (personal emergence) and some settings more criminogenic than others (social emergence)."*
>
> (Wikström, 2017, p. 502)

The previous section describes the way in which the causes of crime are situational. SAT's social model understands the nature and content of situations as being determined by the causes of the causes, such as broader social conditions and individual development. Causes of the causes may have dramatic influence on the crime event, but this influence is not direct. Instead, they affect the crime event indirectly via their influence on the causes of crime. This more distal role for cultural, structural and developmental factors such as macro social conditions and intra-personal change does not, however, undermine their importance (Wikström, 2017; Wikström & Sampson, 2003). The influence such causes of the causes takes place via processes of selection, change, or both. Initially introduced in 2005 (Wikström, 2005), the SAT approach to stability, change and selection was further developed theoretically (Wikström & Treiber, 2009b, 2018, in press) and has recently undergone extensive empirical testing (Wikström, Treiber, et al., Forthcoming).

The SAT sub-model of selection states that processes of social and self selection interact to introduce certain kinds of people to certain kinds of settings, which creates certain kinds of person-environment interactions (i.e., situations). Note that selection is an important explanatory factor within SAT; in contrast to traditional discussions of selection which frame it as a bias that may cause problems for analysis. The SAT sub-model of change provides answers to questions about how and why people develop high crime propensities (process of personal development) and how and why settings develop a weak law-relevant moral context (process of social emergence).

Over time, these contemporaneous processes of social and self selection and social and personal emergence come to determine a person's perception of action alternatives and their processes of choice because of the particular settings in which they develop and act (are exposed to). Central to the sub-models of selection and change is the premise that past events and a person's background cannot influence present events and instead they have a (potentially very crucial) indirect effect (Lewin, 1936; Schick, 1997; Wikström, 2006). For this reason, SAT refers to these factors as 'causes of the causes'.

There is a potentially large role for parental monitoring processes in the SAT's social model of development and change, particularly in the processes of personal emergence, and social and self selection. Though not the focus of this thesis, these are briefly outlined with reference to the existing literature in section 5.2:.

2.5: Summary

A detailed exposition of SAT has been done elsewhere and is not repeated here (Treiber, 2017b; Wikström, 2006, 2010a, 2017; Wikström, Oberwittler, et al., 2012). The theoretical framework of Situational Action Theory presented in this chapter solves problems of causation and explanation that are often the pitfalls of other criminological theories and empirical work investigating the causes of crime. The situational approach of SAT integrates individual and environmental perspectives to provide a testable model of crime causation. The SAT explanation of crime involves three fundamental mechanisms (Wikström, 2017, p. 502).

i) The perception-choice process is the action mechanism that links people and places to explain why crime happens.
ii) Selection processes link micro and macro features to explain how particular person-environment interactions occur.
iii) Emergence processes of development and change explain how people and environments become as they are.

SAT provides the ideal framework for this thesis because these mechanisms help to specify multiple (integrated) means by which factors such as poor parental monitoring may plausibly influence crime. Detailed discussion of mechanisms is generally lacking in the parental monitoring literature (see chapter 5). In particular, situational causal processes are particularly rarely discussed or assessed, even implicitly. For this reason, the focus of this thesis is narrowed specifically to the role of parental monitoring in SAT's situational model of SAT (mechanism i) above). The main novel contribution of this chapter is specific development of the concepts of interaction and situation and relevant discussion of their historical context. These concepts are crucial to detailed theoretical development of the situational model (chapter 6) and the analytical approach to situational interaction (chapter 7). Prior to this, the following chapter briefly introduces the topic of the thesis – parents, adolescents and crime.

3 Parents, adolescents and crime

Chapter 1 identified the significance of crime and the need to prevent crime (and crime by young people in particular); and outlined the importance for prevention of understanding the processes that link causes to resultant crime. Chapter 2 provided a suitable theoretical framework within which to conduct such research. The next question is: why study the role of parental monitoring in an effort to reduce crime? This brief chapter is not intended to review literature or detail adolescent behaviour or development nor parenting; but aims to summarise three relevant aspects of these in order to justify the focus of this thesis on the role of parental monitoring in processes leading to crime (the concept of parental monitoring is discussed in the next chapter).

i) Adolescence is a crucial period in the development of young people. Change and development in adolescence refers to the developing individual, but also changes in their exposure to different contexts. Both these kinds of interrelated changes are relevant to changes in behavioural outcomes, including offending.

ii) Poor parenting is seen by many as the root of adolescent crime; and this stance is strengthened by a wealth of empirical research showing strong relations between family constructs and crime. In what ways can parents influence crime outcomes? Parents, their parenting behaviours and their relationships with their children are fundamental to the developmental and behavioural outcomes of this period of change. This thesis argues that parents guide and control the content and extent of exposure to contexts of both development and action. These conceptual distinctions and the role of context in behaviour and development are routinely ignored in much parenting research.

iii) The implication is that there is something that parents can do about preventing crime. In particular, parental monitoring and supervision is regularly and strongly associated with fewer or reduced offending outcomes; however, very little is known about the mechanisms by which these parenting behaviours may influence offending behaviour. As discussed in chapter 1, understanding of these causes and processes is crucial to effective policy and practice in crime prevention.

3.1: Adolescence

As previously evidenced, adolescence appears to be an important period for the development of offending (see section 1.1.1:).[1] Adolescence is also a crucial time for both the developing individual; and for changes to the lifestyle and experiences of the adolescent. The word adolescence is derived from the Latin term meaning 'to grow up'. Therefore, adolescence refers to a series of transitions during the period of growing up from immaturity in childhood to maturity in adulthood. The main function of these transitions is to prepare children for adult roles. These transitions are numerous and broad; occurring in biological, psychological, social, cognitive, emotional, interpersonal, legal, educational, chronological, economic and cultural domains[2] (for a broad discussion of adolescence, see for example, Coleman & Hendry, 1999; Steinberg, 2002). This definition of adolescence holds across many cultures, societies and historical epochs (Larson & Wilson, 2004); however, these multiple domain-specific transitions take place at different ages for different individuals and are historically, culturally and socially relative. This makes defining the boundaries of adolescence difficult (either in terms of markers or chronological age), so whilst definitions of adolescence are broadly uncontested, understandably the particular boundaries of adolescence that are used vary depending on those defining the boundaries and their rationale.

> *"It is commonly said that adolescence begins in biology and ends in culture, because the transition into adolescence is marked by the dramatic biological changes of puberty, while the transition to adulthood is less clearly marked"*
>
> (Smetana, Campione-Barr, & Metzger, 2006, p. 258)

For many, the end of childhood is signified by the onset of puberty, and - in western cultures at least - the onset of adulthood is usually defined legally by the 'age of majority'. This means that the boundaries of adolescence are often defined using the developmental period from puberty to legal adulthood. Due to the varying nature of the onset and duration of biological developments, and cultural, social and historical variation in the age of both majority and criminal responsibility; chronological age can only ever be a rough marker for adolescence. For example, a leading paediatrics textbook asserts that the age of adolescence has been widely accepted as being between 13-19 (Marcell, 2007); however, trends toward earlier physical maturation and prolonged economic dependence on parents has led Steinberg to state that it 'makes sense' to think of adolescence as "beginning around age 10 and ending in the early twenties" (2002, p. 3). This makes for a long (and potentially lengthening) period of varied and heterogeneous

[1] This focus on adolescence does not preclude the importance for crime (and for adolescence itself) of other crucial periods of development and change, such as early childhood and childhood.
[2] These domains may overlap (e.g., psychological and emotional).

transitions and development, so some researchers and practitioners have opted to subdivide adolescence, for example, into early, middle and late (e.g., Clark-Lempers, Lempers, & Ho, 1991; Eisenberg, Carlo, Murphy, & Court, 1995; Roscoe, Diana, & Brooks, 1987). Ultimately, and regardless of such categorisation and divisions, for understanding the causes of young people's crime it is the content of what occurs during adolescence that is of conceptual relevance; the chronological age chosen to capture this period of transitions is an operational issue (dealt with in section 8.1.1:).

The transitional nature of adolescence means that it is a period that is characterised by rapid changes. The main goals of these changes are to achieve agency (acting autonomously) and communion (connecting with others) (Collins & Steinberg, 2008; Steinberg, 2002). These changes take place in two domains: i) physical and psychological development (e.g., first menarche/ejaculation, physical growth, cognitive development) and ii) social redefinition.

Firstly, in terms of development, all species experience growth and physical development of some kind. However, adolescence is unique to humans because no other species has a brain like ours. Human brains develop at a fast rate, and by adolescence contain many connections and neural pathways. Adolescence is a period when our brains become sleeker. Adolescent brains undergo neural pruning, myelination, and a 'rewiring' of the prefrontal cortex and the limbic system in order that cognition, decision-making, and brain functioning in general become faster, more efficient and space-saving. Therefore the outcomes of this functioning may be different during this adolescent process (e.g., the temporary dip in reward that results from this process might explain increased thrill seeking in adolescence). (See, further, Blakemore, 2012; Casey, Getz, & Galvan, 2008; Steinberg, 2010a; Steinberg, 2010b on the adolescent brain and neurodevelopment.) As well as physical developments, humans experience psychological developments. These are not unique to humans, though the content and perhaps complexity of them differs from other species. For example, human socialisation processes include moral development and the learning of rules and expectations of behaviour (Gecas, 2010; Grusec, 2011). These processes rely on social learning (e.g., Scott, 1971) or modelling (e.g., Bandura, 1974) (see further, section 5.2.1.3: and also Wikström and Treiber (2018, in press); Wikström, Treiber, et al. (Forthcoming).

Secondly, social redefinition refers to changes in social status including increases in the responsibilities entrusted by society (e.g., legal milestones related to alcohol, sex, suffrage, driving etc.) and the expectation of the acquisition of social roles and economic participation. This increase in responsibility and expectation is related to the concept of independence. There are

three broad categories of independence; emotional autonomy (subjective feelings of independence), behavioural autonomy (capacity for self-governance and independent decision-making), and value autonomy (independent world view that underpins beliefs and principles) (Douvan & Adelson, 1966). Collins and Steinberg (2008) observe that independence is usually conceived of as an individual achievement, and in that sense is most often studied as an outcome; but that in fact adolescents become independent from or in relation to others (e.g., parents), and that this is accomplished via a process that may be influenced by both personal and relational changes during the adolescent period. Parents are therefore crucial to this process of independence (of which social redefinition is one end product).

These changes have implications for the broadening nature and changing amount of social interactions, experiences and social contextual encounters, which impact upon changing lifestyles, activity fields and environmental exposure during adolescence. One specific impact of such changes is that adolescents 'move away' from parents, spending more time with friends and less with their parents (Berndt, 1979; Crosnoe & Trinitapoli, 2008; Eccles et al., 1993; Furstenberg, 2000; Grolnick, Beiswenger, & Price, 2008; Janssen, Deković, & Bruinsma, 2014; Keijsers, Branje, VanderValk, & Meeus, 2010; Meeus & Dekovic, 1995; Steinberg, 2001; Wikström & Butterworth, 2006; Wikström, Oberwittler, et al., 2012). This means that the amount of time adolescents spend unsupervised increases as they age (Janssen et al., 2014; Laird, Pettit, Dodge, & Bates, 2003; Larson, Richards, Moneta, Holmbeck, & Duckett, 1996; Patterson & Stouthamer-Loeber, 1984; Wikström, Oberwittler, et al., 2012).

These two domains of development and redefinition in adolescence often interrelate. For example, the increased social trust conferred on adolescents may result from developments in their decision-making abilities and physical capabilities; and conversely, the development of interpersonal skills may be fostered by extended contact and influence from a broadening range of people and contexts to which adolescents are exposed due to changing social roles.

The transitions, changes, and developments that characterise adolescence do not occur in a vacuum. Adolescence is an outcome of an ecological interaction between these changes and the increasing and increasingly varied contexts in which the adolescent is growing up (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006; Hill, 1983; Kirk, 2009; Steinberg, 2002). Bronfenbrenner's 'bioecological paradigm' refers to continuing interactions in the immediate environment as 'proximal processes', by which (particularly early) human development takes place. This occurs "through processes of progressively more complex reciprocal interaction

between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate environment." (Bronfenbrenner, 1995, p. 620).

This means that change and development in adolescence refers not only to the changing and developing individual, but also changes in their exposure to environments (and the features and circumstances of environments). This distinction is crucial and is discussed further in chapters 2 and 5 as it has particular relevance for the situational focus of this thesis. Both these changes are relevant for action and behavioural outcomes, making adolescence an important period of study in the pursuit of knowledge about the causes of crime.

3.2: Parents

> *"Despite the fact that most people become parents, and all children who ever lived have had parents, parenting is a somewhat mystifying process, which almost everyone has opinions on but about which few people appear to agree. Yet, one thing is sure: it is the principle and continuing task of parents in each generation to prepare children of the next generation for the physical, economic, and psychosocial situations in which their children must survive and hopefully thrive"*
>
> (Bornstein, 2008, p. 265)

> *"Parents whose kids do well take credit for it, and the obverse of their self-congratulation is that parents whose kids do badly must have erred"*
>
> (Solomon, 2013, p. 537).

Parents[3] play a role in both the long term socialisation processes that influence the development of their children, and in the short term processes that determine their children's everyday interactions and behaviours.[4] To varying degrees parents are blamed for the crimes of their children because of perceived failure in these dual roles.

The academic consensus is that parenting literature and research is focused on one of two perspectives, either dimensions of parenting or parenting typologies (Darling & Steinberg, 1993; Hoeve et al., 2009; Smetana, Campione-Barr, et al., 2006). Dimensions conceptually categorise particular parenting behaviours (e.g., monitoring, attention, physical punishment, reasoning), most commonly into two dimensions; support and control (Maccoby & Martin, 1983). Support refers to both positive and negative parenting behaviours that influence whether the child feels accepted, comfortable and approved (e.g., affection, sensitivity, communication, neglect,

[3] Although there may be differences between different types of guardians the term 'parent' will be used in this thesis to refer to include those appointed to or adopting the parental role, e.g., foster or adoptive parents and other legal guardians, because the discussion points broadly apply at this level of analysis.

[4] Although both kinds of processes and parenting actions are acknowledged in the literature, these distinctions are not often clearly specified (see further, chapter 5).

rejection) (Rollins & Thomas, 1979). Control refers to controlling the child and placing demands on them and is categorised into behavioural control (e.g., rule setting, management of activities, monitoring, discipline) or psychological control (e.g., love withdrawal, use of guilt) (Barber, 1996). The control dimension of parenting behaviour was previously categorised as either authoritative or authoritarian control (Baumrind, 1968), but this was later elaborated into a typology approach to parenting based on a combination of both the support and control dimensions of parenting (Maccoby & Martin, 1983). These parenting typologies (styles) therefore represent four particular bi-dimensional combinations of attitudes and behaviours towards children. The specifics of these will not be discussed further here. It is these parenting typologies or styles that build a parenting and family context (Darling & Steinberg, 1993).

For almost all children, the family is a major (arguably *the* major) context for socialisation and interpersonal development, including the changes inherent in adolescence (Baumrind, 1978; Bornstein, 1995a; Bronfenbrenner, 1986; Farrington & Welsh, 2006; Maccoby & Martin, 1983; Maslow, 1954; Steinberg, 2002; Wikström, Treiber, et al., Forthcoming). In socialisation terms, parents are children's first and most 'significant others' (Mead, 1934; Sullivan, 1953). Most young children form an immediate and usually strong and lasting attachment bond to parents (particularly the mother) (Bowlby, 1969; Cummings & Cummings, 2002),[5] and are entirely dependent on their parents for their most fundamental human needs (e.g., food, shelter, health, security). Almost all their early socialisation experiences take place within the family.[6] The role of parents in their child's psychological development starts before birth and the dominance of parents and the family context in the processes of development largely remains the case as children age into adolescence and beyond (see, e.g., Adelson & Douvan, 1966; Warr, 2002).[7] Parents are key agents of learning and modelling (e.g., Maccoby, 1992; Steinberg, 2002; Steinberg & Silk, 2002), and therefore shape and modify their offspring in long-term processes as they

[5] Although the emotional bond and personal ties between parents and children is regularly cited as a crucial element of the socialisation process (e.g., Hechter, 1987; Hirschi, 1969), the overly simplistic assumption that overall levels of stimulation and involvement by parents affects the child's overall level of development (e.g., Maccoby & Martin, 1983) has been replaced in the literature by an increasing acknowledgment that parenting effects (e.g., of beliefs and behaviours) on their child's development and actions are complex, time and context sensitive, both specific and general, and interactional and reciprocal (see, for discussion, Bornstein, 1995a, 1995b; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Wikström, Treiber, et al., Forthcoming).

[6] Other socialisation agents that are invited into or encroach upon the family context, such as the mass media and religion, also provide additional sources of socialisation for some children within the family context.

[7] The introduction of contexts external to the family such as childcare, school, work and independent socialising with peers into children's' lives at some time adds additional adult caregivers/ supervisors and other important socialisation contexts. Note also that critics of early socialization research that fixates on parenting, such as Judith Rich-Harris, suggest other influences (i.e., peers and heredity) may contribute more than parenting to individual differences in behaviour in adolescence and adulthood (e.g., Harris, 1998), and some early research also suggests that the family has little influence on youth (Barth, Watson, & Blanchard, 1966) and that adolescents reject their parents in preference for their peers (Coleman, 1961).

develop, resulting in relatively stable characteristics of the young person which they carry with them through their everyday life (Gecas, 2010; Grusec, 2011; Steinberg, 2001). Parents have influence over various features of this development. For example, socialisation processes, whereby parents are "not only the bearers, but also the *selective filters*, of the general culture" (Glueck & Glueck, 1952, p. 192) impact on moral development (i.e., the development of normative rules of conduct); and parents can also play a role processes of cognitive nurturing, which influence executive functioning (e.g., ability to exercise self control) (Treiber, 2008; Wikström & Treiber, 2018, in press; Wikström, Treiber, et al., Forthcoming).

Directly and indirectly, the family and parents are also a key source of behavioural control during this period of change (Gottfredson & Hirschi, 1990; Hagan, 1989; Hirschi, 1969; Nye, 1958; Patterson, 1982; Rankin & Wells, 2006; Sampson & Laub, 1993; Thornberry, 1987; Wells & Rankin, 1988). Though the kinds of control and how parents may play a role are varied and complex (see further, chapters 5 and 6). Parents also control, shape, select, limit and guide the extent and content of their child's exposure to individuals and settings (and their circumstances). Specifically, for empirical findings and discussion of the role of parents in criminogenic exposure and changes in criminogenic exposure see, Janssen et al. (2014); Wikström (2005); Wikström, Treiber, et al. (Forthcoming). The influence of parents on the content and extent of exposure is wide-ranging, for example; within certain (sometimes very narrow) constraints, parents choose the neighbourhood in which the child grows up and the schools their child attends; parents influence their child's friendship groups, guide their activities, and in many ways directly control their movements and experiences; and parents are often able to mould the nature of settings to which adolescents are exposed (including, for example, by being present). However, the development and social redefinition in adolescence affect this parental influence, the family context, and the efficacy and content of processes that take place within the family. Biological, psychological and social changes mean that adolescents experience and exhibit increasing influence and assertiveness within the family; and changes in societal expectations and roles lead to increased trust and autonomy within the family. The transitional period of adolescence is therefore a time of reorganisation of relationships and day to day interactions whereby family relations become more equal and less asymmetrical, and adolescents have increasing influence over their own experiences and exposures. (For a discussion see further, Coleman & Hendry, 1999; Hendry, Shucksmith, Love, & Glendinning, 1993; Keijsers et al., 2010; Steinberg, 2002; Wikström, 2005).

This discussion of the role of parents in both processes of individual development and change in contextual exposure is framed by the concept of independence. This concept was introduced in the previous section. The function of the transitions that take place during adolescence is to prepare children for adulthood, and key to this preparation is emotional, behavioural and value independence. This means that a crucial role for parents is to facilitate and guide their children in their acquisition of these kinds of independence. This highlights the importance of parental roles in a range of adolescent changes. Examples of changes in the process of gaining independence that take place in interpersonal contexts are changes to the dynamic parent-child relationship (and therefore family context and parenting style); moral development; and the development of the capacity for self-governance (i.e., in the absence of external monitoring or in the presence of excessive external influence) (for a discussion of the development of autonomy and independence in interpersonal context, see, Collins & Steinberg, 2008).

3.2.1.1: Clarifying kinds of parental influence

The contribution of this section is to draw attention to a two particular distinctions that are only implicit in most of the approaches to the study of parenting summarised above.[8] It is not the aim of this thesis to extensively detail these distinctions and their intersection. However, these distinctions represent themes that underlie much of the content of this thesis and are therefore tentatively summarised here. Firstly, parents play a dual role during the transitional period of adolescence such that almost all parents are active agents of i) socialisation (development), and ii) direct behavioural influence (action). Developmental and behavioural outcomes in children are key parental goals (see further, section 4.2.2.1:). Secondly, broadly speaking, parenting behaviours can be either guiding, or controlling in nature. In short, guidance refers to the fostering, impelling and guiding of development and behaviour from the outset; whereas control refers to the inhibiting, constraining and controlling of development and behaviour after its inception.[9]

The intersection of these dimensions of parenting goals and parenting behaviour types results in four kinds of parental influence (Table 2); parents can i) guide development, ii) control development, iii) guide action, or iv) control action. A final observation (not discussed further in this thesis) is that this parenting all takes place within a family context (and parenting style) that is (at least initially) defined by parental attitudes and behaviours (see, e.g., Darling & Steinberg, 1993).

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[8] Attention to the goals of parenting, in this case crime prevention, make the need for such a distinction apparent (see further section 4.2.2.1:). Though most often ignored, there is some existing discussion of parenting goals in the literature (for example, Darling & Steinberg, 1993; Dix, 1992).

[9] The distinction between guidance and control, both in general and with reference to parenting behaviours requires further discussion and development beyond the scope of this thesis.

Table 2: Parental influence: intersection of parenting behaviour type and parenting goal

		Parenting goal	
		Development	**Action**
Parenting behaviour type	**Guide**	Guide development	Guide action
	Control	Control development	Control action

This means that in addition to the socialisation (guide development) and direct control (control action) processes that are often studied, parents also have influence on the moral content of settings in which their child acts (guide action), and they have some control over the extent of their exposure to particular individuals and settings over time (control development). Parents have influence over contexts of development, and contexts of action; and these influences can be both guiding and controlling.[10] Permutations of parental influence are discussed in detail in chapter 5.

Of course individuals vary in the influence their parents have (Warr, 2002; Wikström, Treiber, et al., Forthcoming), but despite adolescent transitions, parents remain key agents of guidance and control in the processes of adolescent development and action (and exposure to contexts of development and action). Parents have a continued role in adolescent development and action during and beyond the changes inherent in adolescence via their influence over both the process of independence and action outcomes. The specific nature of this parental influence will not be discussed in general terms further here.

3.2.2: Parental influence on adolescent crime

Academic and lay conclusions about the role of parenting in crime related outcomes do not usually explicitly distinguish between the two major areas of parental influence of importance for adolescence (development and action), but their terminology describes them: The first relates to the development of characteristics and capabilities in the child; virtue, attitude, values, morality, respect for others, temperament, decision-making skills, justice, temperance and restraint, and grasp of consequences. The second is about direct parental influence on action; involving admonition, adequate vigilance, limitations and prevention, and control over exposure. Neither

[10] Situational Action Theory is a theory of action that emphasises distinctions between developmental and situational processes, and concepts of control and guidance. Within the framework of SAT, integration of such distinctions with the model of goal-directed parental action introduced in chapter 4 would provide a powerful new model of parenting. This is beyond the scope of this thesis.

do such conclusions explicitly categorise between concepts of control and guidance. Chapter 5 aims to organise these many features and processes found within the literature on parenting and crime within a coherent theory of development and action (SAT).

Consistently across disciplines, approaches and historical epochs, the social institution of the family (and in particular the role of parents) features heavily in academic discussions and findings about young people's crime.[11] For example; the crucial dual roles of the family are implicit in Plato's statements of the importance of the early childhood years for crime: "all of us have a mutual interest in the virtue of one another… for societies cannot exist if only a few have virtue… Virtues such as justice and temperance can be taught… Education and admonition (should) commence the first five years of childhood." (Plato, 380 B.C. (circa)).

Findings from key large-scale criminological studies that together span decades of research highlight the importance of the family context and parenting behaviours for offending by young people (e.g., Glueck & Glueck, 1950, 1962; Loeber & Stouthamer-Loeber, 1986; J. McCord, 1979; Nye, 1958; Patterson & Stouthamer-Loeber, 1984; Sampson & Laub, 1993; Simons, Simons, Burt, Brody, & Cutrona, 2005; West & Farrington, 1973; Wikström, Oberwittler, et al., 2012).[12] Although not usually explicitly delineated, these conclusions include examples of both development and control elements of parenting. For example, early results from the Cambridge Study of Delinquent development were shown to "lend strong support to the theory that the unsatisfactory *attitudes and methods* of individual parents play an important part in the genesis of juvenile delinquency" (West & Farrington, 1973, p. 193, emphsis added); and Eleanor and Sheldon Glueck raised questions about multiple mechanisms "we know that unsuitable supervision of boys… is far more usual in the background of delinquents than of nondelinquents. Is this a direct influence on delinquency, or does it operate, in part at least, through the development in a child of certain traits which are, in turn, more characteristic of delinquents than of nodelinnquents?" (Glueck & Glueck, 1962, pp. 132-133). Despite implying multiple mechanisms by which parents might influence crime, these causes are "hotly debated" (Shelton, Frick, & Wootton, 1996, p. 317), and do not usually explicitly specify the processes by which parents influence their children's actions.

[11] Ironically in the light of this ubiquitousness, the role of the family went ignored in theories of delinquency (particularly sociological theories such as that of Cloward and Ohlin) until Hirschi's theory of social control (Hirschi, 1969) brought the family back into the picture of crime causation (Laub, 2011). Laub writes how Hirschi feels that this prior neglect meant that the views of criminologists (and sociologists studying criminal behaviour) were out of line with those of the general public, including parents (Laub, 2011).

[12] In addition, meta-analyses highlight family factors as the second best predictors of recidivism (after offence history) compared to other domains (Cottle, Lee, & Heilbrun, 2001; Gendreau, Little, & Goggin, 1996).

Further evidence for the efficacy of parenting for averting or reducing crime involvement comes from evaluation studies that demonstrate some success of various parenting-focused interventions (such as parent management training), many of which target crime and anti-social behaviour outcomes (see, e.g., Dishion, Nelson, & Kavanagh, 2003; Forgatch & Patterson, 2010; Henggeler, Mihalic, Rone, Thomas, & Timmons-Mitchell, 1998; Olds et al., 1998; Patterson, 1982; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2008; Sanders, Markie-Dadds, Tully, & Bor, 2000; Scott, Spender, Doolan, Jacobs, & Aspland, 2001; Webster-Stratton, 2000; Webster-Stratton & Hammond, 1997).

> *"Improvements in parenting practices during well-designed intervention studies produce decreases in a child's anti-social behaviour"*
>
> (Dishion & Patterson, 2006, p. 519)

Many of these such programmes (or modules within programmes) target increased parental monitoring and awareness of the child's activities, as well as an improved ability to make clear what the rules are and reinforce them (e.g., Patterson, 1982). That these programmes have these dual aims is evidence of the belief that both elements of parenting (guidance and control) have influence on behavioural outcomes. However, these programmes do not state how they understand the processes of this dual influence to occur.

These various academic conclusions are also reflected in public opinion and general consensus about parenting and crime, which often blames poor parenting, in particular, poor discipline or control of children for crime. For example, when asked about youth crime, members of the UK public listed poor parenting (reflected in an under-developed respect for authority, poor understanding of the consequences of their actions, and in particular in an absence of control, e.g., children 'running wild'), as a main concern (Jacobson & Kirby, 2012), and Farrington (2010) cites a 1988 UK newspaper survey where adults reported the most popularly reported main cause of crime was lack of parental discipline (nominated by 53%). In addition, parents of serious offenders are often lambasted by both the public and media (see, Solomon, 2013).

Conclusions about the role of parenting in the aetiology of offending drawn by both academics and the public intimate their belief that there is something parents can do to influence whether their children commit crime or not. Actually, it is more accurate to say that it is the *absence* of certain parenting behaviours that is believed to be crucial for offending; i.e., parents of offenders are found lacking, or have failed. An extreme response is the punishment of parents for the crimes of their children (Arthur, 2005; Bessant & Hil, 1998; Dundes, 1994; see also section 11.3:). Again, although not explicitly stated in these terms, this parental failure is deemed to be

one of either development or control. For example, when writing about the experiences of families dealing with a particular condition in a child (including disability, prodigy, autism and schizophrenia) Solomon observes that "unlike most of the conditions in this book, criminality is the child's fault, something he has done deliberately and with choice. It is also the parents' fault, something they could have prevented with decent moral education and adequate vigilance. These, at least, are the popular conceptions" (2013, p. 537).

3.3: Parental monitoring

> *"Parental monitoring or supervision is the aspect of family management that is most consistently related to delinquency"*
>
> (Smith & Stern, 1997, p. 384)

If parents can prevent their offspring becoming involved in crime, specifically what is it that they can do? As already described, the importance of family factors as key predictors of offending is overwhelmingly clear from a wealth of academic research. Also apparent from the array of family-related crime correlates (see, e.g., Ellis et al., 2009) is that a "bewildering variety of family constructs" (Farrington, 2010, p. 203) build this picture. To start to disentangle these factors in order to understand the role of parenting in crime prevention, it is important to deconstruct elements of parenting that may relate to crime in different ways. Section 3.2: introduced existing and new ways of delineating parenting.

The family factors that commonly correlate with crime include a large range of both parenting styles and parenting practices. Despite this breadth and variety, it is widely accepted that of all the features of parenting style, parental management and child-rearing methods, poor parental monitoring (commonly operationalised by low parental supervision or a lack of parental knowledge of whereabouts, activities, and associations) is one of the strongest predictors that is routinely and consistently related to young people's offending (Coleman & Hendry, 1999; Crouter & Head, 2002; Dishion & McMahon, 1998; Farrington, 2010; Farrington & Loeber, 1999; Farrington & Welsh, 2006; Glueck & Glueck, 1950, 1962; Hoeve et al., 2009; Kerr & Stattin, 2000; Loeber & Stouthamer-Loeber, 1986; Pagani, 2009; Reckless, 1940; Sampson & Laub, 1993; Smith & Stern, 1997; Steinberg & Silk, 2002; Wilson, 1987).[13] As Farrington

[13] Not only is poor parental supervision related to offending, but the converse is also true, that better-than-average parental supervision is related to non-offending (Stouthamer-Loeber et al., 1993). In addition, whilst poor parental monitoring is related to crime, good parental monitoring is associated with positive outcomes (e.g., higher academic achievement and better adolescent adjustment) (Lamborn, Dornbusch, & Steinberg, 1996; Pettit, Laird, Dodge, Bates, & Criss, 2001).

summarises, "many studies show that parents who do not know where their children are when they are out, and parents who let their children roam the streets unsupervised from an early age, tend to have delinquent children" (2010, p. 207).

Despite this robust and clear association, few studies or theories adequately provide a well developed account of the process by which parental monitoring may prevent crime, or place this correlation within the family context (e.g., parenting style) or wider context (i.e., outside family dynamics) of crime causation (see further, chapter 5). Farrington states that:

> *"studies should go beyond demonstrating that family factors predict offending and should seek to determine the key causal mechanisms that are involved. This should help in greatly designing family-based prevention programs to reduce crime"*
>
> (Farrington, 2010, p. 216)

Despite such observations, much of the specific parental monitoring literature pays scant attention to mechanisms, simply replicating findings of associations between parental knowledge and crime, and parental supervision and crime. At best, studies examine (sometimes multiple) factors that mediate these (multiple) relationships (e.g., Janssen, 2015), though it is important to emphasise that i) mediating factors are not mechanisms (see section 1.2.1.2:), and ii) testing the relative contribution of factors (representing for example, individual and environmental influences) assesses only additive and not interactive processes. Farrington (2010, 2011) states the importance of identifying family factors that are in fact causes by explicating mechanisms, and uses some examples to highlight the importance of attention to interaction between causes; but doesn't attempt to do this, nor specify how this should be done.

In relation to parental monitoring, the important questions for crime prevention are precisely *how* and *why* a lack of parental monitoring might influence adolescent offending (chapter 5). A starting point for tackling these questions is to specify and clarify the concept of parental monitoring, which is the rationale for the following chapter (chapter 4).

3.4: Summary

Adolescence is a crucial period in the development of young people, and the changes and transitions of adolescence are relevant to changes in behavioural outcomes, including offending. The role of parents in the parent-child relationship, family context, and more specifically parental behaviours are fundamental to the developmental and behavioural outcomes of this period of change. Although the specifics of these processes are rarely fully detailed or delineated, it is widely believed that parents of offenders have not adequately fulfilled their role in guiding or

controlling their children's development or action. The common implication of much discourse on adolescent crime is that parenting failures in these regards are to blame. Whilst many other factors may impact on adolescent crime and a parent's ability and motivation to prevent crime, at least, there is huge potential for direct and indirect parental influence on the actions of their children and therefore crime prevention.

In Situational Action Theory terminology, this means that parents can have influence in both developmental and situational processes. Parental monitoring is one area of parenting behaviour that has attracted attention because of strong associations with offending. The implication is that with adequate parental monitoring parents can prevent or reduce offending by their child (and conversely, that offenders lack monitoring by their parents). Discussion or empirical evidence of specifically how this may occur is most often lacking from studies of parental monitoring and crime (chapter 5). However, such 'how' questions are crucial to understanding if, and if so how, policy and practice should and could aim to improve parental monitoring in an effort to prevent crime. During discussion of both adolescence and parenting, this chapter identified and emphasised themes that are to recur throughout this thesis (e.g., parental guidance and control roles in processes of development and action) in an effort to create a foundation on which to build an adequate explanation of the role of parental monitoring in adolescent crime.

Analytical criminology and SAT draw attention to the importance of definitions and conceptual clarity. The following chapter (chapter 4) sets out in detail a new conception of the parental monitoring process as a model of goal-directed parental action, and therefore also provides new insights into the concepts of parental supervision and parental knowledge.

PART II: EXPLANATION:

Prioritising interaction, specifying what and asking how?

4 Parental monitoring, supervision and parental knowledge

Note: this thesis uses the term 'parent' to refer to those appointed to or adopting the parental role, e.g., foster or adoptive parents and other legal guardians. Therefore, the term parental monitoring also includes the monitoring of wards and minors by guardians appointed to or adopting the parental role.[1]

> *"In order for research and theorizing to be more effective and valid, the specification and clarification of the concepts and methods that are used are of decisive importance. Too often, the debate about issues has been based on misunderstandings and so has not been fruitful"*
> (Magnusson & Endler, 1977a, p. 23)[2]

Part I provided the rationale for the topic of this thesis – the role of parental monitoring in the reduction or prevention of adolescent crime. The role of parental monitoring in situational processes that lead to action (including acts of crime) is theorised in Part II and analysed in the empirical chapters of this thesis (Part IV). In order to understand the role of parental monitoring it is important to first be clear about the concept. Less than a decade ago, key figures in the parental monitoring literature Kerr, Stattin and Engels called for "a clarification of constructs used" (2008a, p. 4) because there is a lack of clarity and often disagreement in the literature as to what constitutes parental monitoring. The literature boasts a rather haphazard list of diverse measures that attempt to capture parental monitoring, which in reality tap into a range of widely differing phenomenon (Kerr, Stattin, et al., 2008a). Unlike the parental monitoring literature, this chapter considers both the motivation for parental monitoring and the mechanisms by which parenting goals may be realised.[3] This gives rise to a definition of parental monitoring that is clearer and more specific than that employed in parental monitoring research to date.

The first part of this chapter assesses some of the problems with existing definitions and conceptualisations, particularly the misconceptualisation of parental monitoring itself. This discussion concludes that traditional conceptions of parental monitoring are only broadly helpful and conflate too many processes to be of use when designing and conducting research that aims

[1] Although different types of guardians may differ in terms of these parenting processes, the level of discussion and analysis in this thesis applies broadly to all parental figures and roles. The argument presented here is about 'parenting' processes, and therefore discussions about specifically who fulfils the parental role and any effect that may have taps into a different kind of question that will not be dealt with in the present study.

[2] Magnusson and Endler are referring to issues in their own field rather than the debate about parenting and parental monitoring, but the quote very appropriately applies here.

[3] The neglect of motivation and mechanism by the parental monitoring literature are probably linked. The absence of purpose in definitions of parental monitoring means attention is not drawn to the mechanisms by which attainment of such outcomes (the implicit goal) might, in part, be realised in part by the parental monitoring behaviours.

to explain outcomes such as crime. This chapter argues that parental action is central to definitions of parental monitoring; however, studies of parental monitoring often ignore, underplay or assume the motivation necessary for this action. Attention to the role of motivation is important to i) understand the wider parenting process, and therefore what parental monitoring is (and isn't), and ii) give substance to the content and nature of the parenting process (including parental monitoring). This discussion identifies a need for a more specific account of parenting processes and goes on to outline a proposed model of parenting that builds on that presented in section 3.2.1.1:. The aim is not to fully specify this model here, but to use this outline to specify and clarify what parental monitoring is, and what it isn't.[4] The model allows parental monitoring to be defined as information gathering, with other elements of vaguer conceptions of monitoring defined (but not fully specified here) in other ways.

The next question, then, is how is monitoring routinely captured, and what do these measures actually mean within the refined definitions and proposed model of parenting? The most commonly used operationalisations of parental monitoring are parental knowledge and parental supervision or presence. The second part of this chapter describes these factors specifically. Despite their common use as proxies for each other, the model of parenting presented in this chapter shows that the concepts of parental monitoring, parental supervision, parental presence and parental knowledge are related but distinct concepts. The presence of guardians other than parents is also included in this study as this concept bridges the gap between parental presence and being unsupervised.

This proposed clarification of concepts allows for unambiguous operationalisation and clarification of theoretical mechanisms, and provides testable implications. This chapter therefore represents crucial groundwork for both positing clear and detailed mechanisms by which parental knowledge and presence of guardians influence crime within the framework of Situational Action Theory (chapter 5 and particularly 6), and for operationalising these factors for empirical study (in part IV). The proposed conceptualisation of parental monitoring excludes many features related to parenting that are often researched in the parental monitoring field and therefore provides clarification of which kinds of factors should be studied distinctly.[5] This chapter also paves the way for the application of a broad model of action in order to understand how related factors other than parental monitoring, parental knowledge, parental presence and the presence of other guardians might be situated within future research on parenting (see further, chapter 11).

[4] This model can and should be further refined and specified prior to alternative and additional applications.
[5] It does not, however, specify details about these additional parenting behaviours nor how they relate to crime.

4.1: Confusion of concepts

> *"Despite the wide use of the term 'parental monitoring', there still remains little agreement regarding the definition of this construct"*
>
> (Racz & McMahon, 2011, p. 378)

> *"Definitions of monitoring are idiosyncratic"*
>
> (Dishion & McMahon, 1998)

Patterson stated one of the earliest conceptions of modern parental monitoring (Patterson, 1982). However, Patterson's long list of wide-ranging behaviours, expectations and emotions set the tone for poor definition and vague conceptualisation of parental monitoring in much of the subsequent literature. His lengthy description of the concept includes the following diverse elements: 'general awareness of the child's whereabouts… set of expectations… become concerned…reinforce the child for a task well done…noticing…attending to…sharing information…genuine expression of interest in the activities and well-being of other family members…listens…give feedback…get the child to respond to the feedback' (Patterson, 1982, pp. 222-223). By including such a vast and varied array of elements in one concept, with no description of how these interrelate, Patterson's parental monitoring concept is very difficult to accurately operationalise.[6]

Patterson et. al.'s work on parenting at the Oregon Social Learning Centre, along with other sources, informed Frick's 1991 Alabama Parenting Questionnaire (APQ) (see, Shelton et al., 1996). Shelton et. al. (1996, p. 320) used ten items from a subset of APQ items that aim to capture 'poor monitoring/ supervision' in a questionnaire given to both parents and children. These ten items capture a broad range of different behaviours, attitudes and beliefs, pertaining to both parents and children. They include items tapping i) parental and adult presence (when at home or out in the dark), ii) poor parental knowledge of peers, activities and whereabouts (including because the parents forgot, didn't bother to check or for unstated reasons), iii) child's compliance with parental monitoring rules (didn't leave a note, came home late), and iv) parent's lack of desire or need to monitor (e.g., child goes out without a set time to be home).

This very broad scale likely conflates a number of discreet factors. Despite an adequate level of reliability (α = .67, Shelton et al., 1996), an acceptable reliability α does not indicate unidemensionality (Cronbach, 1951; Grayson, 2004).[7] This problem becomes apparent when we

[6] Patterson has conceptualised and measured parental monitoring in a range of ways since this early effort (e.g., Larzelere & Patterson, 1990; Snyder & Patterson, 1987) but this chapter highlights how this remains problematic.

[7] Parent reports showed a quite respectable level of internal reliability for the questionnaire 'poor monitoring / supervision' scale (α = .67) (Shelton et al., 1996). However, reliability measures should be interpreted with caution.

are interested in the mechanisms by which 'parental monitoring/supervision' may have influence over child behaviour. First, the varied items may be part of different causal processes leading to acts of crime (or may even be irrelevant to any). For example, the mechanism by which the presence of an adult can influence a child's behaviour (either in the immediate situation, or developmentally over time) may be entirely different to the mechanism by which a parent's knowledge of their child's activities can do so. Second, items that capture child behaviours (e.g., coming home late) and those that capture parental behaviours (e.g., not bothering to check where their child was going) surely have different causal pathways to child action. Third, there is danger of tautology in including items that capture elements of the child's rule breaking behaviour as a cause of a different kind of rule-breaking behaviour. For example, a child's non-compliance with parental monitoring rules is part of the behavioural outcome under study as well a potential cause of it and therefore should not be logically implicated in the causal process. A broad scale that captures diverse behaviours and attitudes of both parents and children, such as the Alabama Parenting Questionnaire parental monitoring/supervision subscale, is of limited use when assessing the specifics of the causal role of such actions and attitudes in behavioural outcomes such as crime.

Martens reports on a factor analysis that divides some diverse elements of a broad conception of parental monitoring into more theoretically meaningful indices (Martens, 1997). These independent factors reflect i) parental knowledge of the circumstances of activity and ii) parental concern to find out about activities and peers.[8] For boys, this 'concern' factor also included items relating to parental control and limit setting. Interestingly, this is in contrast to an independent additional factor of permission-seeking for girls.

In contrast to over-inclusive measures and conceptualisations of parental monitoring, many studies focus on what is just one element of Patterson's conception or Martens' analysis, and use parental knowledge of the circumstances of unsupervised activity as a proxy for parental monitoring. Parental monitoring is therefore commonly captured using measures of the extent of parental knowledge about where their child is, what their child is doing and with whom their

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Firstly, the relatively high number of items in this scale may inflate the reliability α (Cortina, 1993). Secondly, it is important to be clear about what a statistical measure of scale reliability means, and how it might be misleading. A high α for the APQ parental monitoring sub-scale implies that the measured features tend to converge in families, however this should not be confused with a measure of 'unidimensionality' as there may be multiple factors underlying the total scale reliability which should be tested for reliability separately (Cronbach, 1951; Grayson, 2004). Furthermore, child reports of this scale in this study were unreliable. The authors argue that this was because the sample were young (aged 6-13) (Shelton et al., 1996), however it may also be because the items are so varied. There were also some reliability issues with other measures of this scale, see (Shelton et al., 1996).

[8] This division implicitly draws attention to the distinction between parental monitoring factors that involve parental action, and those that do not, see further, section 4.3.3:.

child associates when they are outside the home (for a review, see, Crouter & Head, 2002).[9] Parental supervision is also sometimes used as a proxy (and even synonym) for parental monitoring, and a review shows that this is often assessed using a single measure (Loeber & Stouthamer-Loeber, 1986). Parental supervision is often synonymous with parental presence, and sometimes supervision and knowledge are conflated. Particular issues with the conception and measurement of specifically supervision (in the form of parental presence) and parental knowledge are discussed in detail in section 4.3:.

Though most commonly used, parental knowledge and supervision are not the only conceptions and measures of parental monitoring employed in the literature. Some studies capture child-centred measures such as the child's perception of freedom and responsibility granted by parents (autonomy granting) (Dickson, Laursen, Stattin, & Kerr, 2015); or how much children inform their parents (e.g., with notes, checking in, talking to them) about their activities and plans (Larzelere & Patterson, 1990). More recently, there has been a renewed focus on capturing the actual efforts of parents to monitor and supervise their children, and to set and enforce rules (for a discussion, see section 4.3.3:). These measures capture whether parents require children to ask permission before an activity and report details afterwards; and whether parents exercise a form of informal social control by providing rules and enforcement or consequences for breaking them (parental limit setting) (Dickson et al., 2015; Harris-McKoy & Cui, 2013; Janssen et al., 2014; Janssen, Weerman, & Eichelsheim, 2017; Kerr & Stattin, 2000; Rankin & Kern, 1994; Wikström & Butterworth, 2006).

In different ways, these varied measures and conceptualisations of parental monitoring each draw upon the parenting themes of guidance and control introduced in section 3.2:; and these conceptualisations of parental monitoring may also play different roles in processes of development and action that lead to crime (i.e., the social and situational processes delineated by SAT; chapter 2). However, these distinctions are rarely explicitly drawn in the literature, nor are the specific mechanisms of approaches made clear (see further chapter 5). To theorise and empirically test specific mechanisms by which particular parenting behaviours and associated factors can influence behavioural outcomes in their children (an aim of this thesis), it is important to clarify exactly what is meant by these concepts. This is the aim of the remainder of this chapter.

[9] This is less common since a critical review of this practice by Stattin and Kerr (2000), see section 4.3.3:.

4.2: Clarifying parental monitoring

This section aims to introduce a new model of parental action that helps to situate parental monitoring as part of a parenting process. Building on previous models and conceptions of parenting introduced in section 3.2: (i.e., Bornstein, 1995a; Darling & Steinberg, 1993; Dix, 1992; Maccoby & Martin, 1983), the model identifies three distinct aspects of parenting: i) the goals of parenting;[10] ii) the specific parenting practices used to reach those goals; and iii) the parenting style that creates the emotional climate within which these processes occur (this third aspect is not discussed here).

Situating parental monitoring in this model facilitates the definition of parental monitoring and that of relevant and related features; and also distinguishes it from concepts and factors that are often conflated and confounded. The discussion acknowledges the neglected but fundamental relevance of action, motivation and goals to the definition of parental monitoring and related concepts. The main focus of this model is to be clear about what parental monitoring is, and is not. This results in a considerably rationalised conception of parental monitoring than is commonly encountered in the parental monitoring literature:

> *Parental monitoring is the employment of active information-gathering behaviours by parents to help them to gain knowledge about and evaluate their child's progress towards a range of parentally selected goals.*

4.2.1: Action

'Parenting' and 'monitoring' are verbs, and therefore infer action.[11] Parental monitoring is a parenting behaviour that is part of the wider parenting process. Fundamentally, parental monitoring involves action by parents. Semantically, 'parental monitoring' means the 'monitoring of offspring by parents' and so defining this concept is best approached by detailing the concept of monitoring in general and then applying it to parents and their offspring.

Action is at the centre of all accepted dictionary definitions of monitoring. Such definitions all include some description of observing, recording and/ or checking a process, adaptation or

[10] When applied to the SAT–inspired distinction between processes that guide or control development and processes that guide or control action introduced in section 3.2.1.1:, the respective resulting parenting goals of relevance to this study are i) preventing a child from being an offender (related to criminality) and/or ii) preventing a child from committing an act of crime (related to action).

[11] This is a theme that runs throughout this chapter. Monitoring, supervising, guiding, supporting, controlling, evaluating, adapting, adjusting, and so on, are all elements of the parenting process defined in this chapter that involve action. By contrast, parental knowledge is not a verb and doesn't involve action; however actions are often involved to gather knowledge (gathering, watching, recording, checking, etc.).

activity.[12] In relation to offending behaviour, monitoring can be carried out by police and other agents of criminal justice, for example, the 'supervision of offenders' by the National Offender Management Service[13] and electronic monitoring in the form of wearable tags as an alternative to a custodial sentence.

In the case of parental monitoring, the monitoring action is carried out by parents. Frustratingly, definitions of parental monitoring are not always explicitly provided in studies of parental monitoring, though they can sometimes be inferred from the operationalisation of the concept or discussion of findings. A fundamental aspect of most implicit or explicit definitions is parental action. Many studies quote Dishion and McMahon's definition of parental monitoring which places the deliberate strategies of parents at its heart:

> *"Parental monitoring is a set of correlated parenting behaviours involving attention to and tracking of the child's whereabouts, activities and adaptations."*
>
> (Dishion & McMahon, 1998, p. 61).

4.2.2: Motivation

> *"SAT defines motivation as goal-directed attention; people are motivated to obtain particular outcomes, and act in (preferred) ways they decide will obtain these outcomes"*
>
> (Treiber, 2017b, p. 58).

SAT conceptualises motivation as goal oriented attention (see, Treiber, 2017b), and states that it is necessary for action (Wikström, 2014).[14] Psychologists have long asserted that goals organise behaviour (Lewin, 1935; Pervin, 1989; Tolman, 1932). Despite motivation being necessary for and organising action (including parenting actions such as parental monitoring), to a surprising degree parental motivation is assumed rather than explicit in much classic parenting literature. For example, discussion of motivation is absent from historical reviews of research into parenting styles and socialisation (see, e.g., Baumrind, 2005; Maccoby, 1992, respectively). Publications on parenting that fall within the 'goal regulation tradition' (e.g., Darling & Steinberg, 1993; Dix, 1992) do provide explicit discussions of parental goals and their role in the parenting

[12] The following reference texts and web pages were consulted regarding the definition of monitoring: New International Webster's Comprehensive Dictionary of the English Language; World English dictionary (Collins) on dictionary.com; The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company, updated in 2009, published by Houghton Mifflin Company; Oxford Dictionaries (OUP); Collins Thesaurus of the English Language, complete and unabridged 2nd Edition, 2002 © HarperCollins Publishers 1995, 2002; Synonym.com; WordNet 3.0, Farlex clipart collection © 2003-2012 Princeton University, Farlex Inc.; YourDictionary Definitions, copyright © 2012 by LoveToKnow Corp.; Thesaurus.com; Collins English Dictionary.

[13] This is also an example of common blurring of the conceptual differences between monitoring and supervision, see further section 4.3:.

[14] The concept of motivation is discussed further in section 6.2.1: in relation to the motivation to carry out acts of crime. For further detailed discussion of the related key concepts of desires and beliefs, intention, consequences, commitments and interferences, see Wikström (2006).

process, but such emphasis on goals and motivation is unfortunately not integrated into the mainstream of the parenting field.

Despite the centrality of action in most definitions of parental monitoring, the content and specifics of parental goals that guide that action are often disregarded. Dishion and McMahon's definition captures a broad spectrum of deliberate strategies involved in parental monitoring (see section 4.2.1:). The central positioning of parental action by Dishion and McMahon leads Stattin and Kerr to state that their "definition of monitoring as parental action is similar to the dictionary definition" (2000, p. 1072). However, many dictionary definitions of monitoring also explicitly involve motivation towards a specific outcome. They include terms such as 'for the purpose of…' and 'with a view to…', and, even in the example dictionary definition cited by Stattin and Kerr themselves, "as a means of…" (2000, p. 1072). Dishion and McMahon do state specifically that the function of the parenting activities they outline is "to facilitate parental awareness of the child's activities and to communicate to the child that the parent is concerned about, and aware of, the child's activities" (Dishion & McMahon, 1998, p. 65), however, this is arguably not the real end goal of the actions they define as parental monitoring. They only take account of the true purpose of the attention and tracking efforts of parents implicitly, during discussion of some of the outcomes deemed relevant to parental monitoring across the literature (for example; the safety of young children, the development of childhood anti-social behaviour, substance use, and positive dimensions of adjustment such as self-esteem and academic achievement).[15] Due to this disregard of the fundamental parental motivation for parental monitoring actions, motivation and goals are not explicitly mentioned in what has come to be recognised as Dishion and McMahon's definition of parental monitoring (quoted in section 4.2.1:), and is a just a list of specific kinds of parental actions. Unfortunately therefore, Dishion and McMahon inadvertently encourage the many researchers who later employ their conception of parental monitoring to fail to emphasise the parental motivation for monitoring. Motivation is the crucial first step to action which often drives the content of the process, and therefore should be more explicitly acknowledged in research on actions such as parental monitoring. If motivation is goal-directed attention (as stated by SAT), what are parental goals?

4.2.2.1: Parental goals: avoiding criminality and preventing acts of crime

> *"Goals are central organising constructs that are presumed to guide cognition, affect and behaviour. They influence how parents process information, which emotions they experience, and which courses of action they consider"*
>
> (Dix, 1992, p. 321)

[15] They also discuss the implications of 'motivation to monitor' for prevention strategies.

In general terms, the content of goals determines the content of the action process. Although often omitted from discussions in the parenting literature, what are the goals that motivate action by parents? Parental goals may vary across time, cultures and idiosyncratic parents (Bornstein, 2008; Grusec, 2008). Dix (1992) categorises parenting goals as parent-oriented goals (e.g., obedience and short-term compliance); child centred or socialisation goals (e.g., teaching the child important lessons about values); and empathic goals (e.g., satisfying the child's emotional needs); and states that effective parenting requires a balance between these (i.e., between what children want, what children need, and what parents want and need). Reflecting back on the distinctions drawn in section 3.2.1.1:; parent oriented goals require parental behaviours that control; child centred goals require parental behaviours that guide. In line with the social and situational models of SAT, parenting goals for their children can also be described as long-term developmental goals (avoiding criminality) or short term situational goals (preventing acts of crime), although this distinction is not strictly binary. Although Dix (1992) and Darling and Steinberg (1993) hint at this distinction between developmental consequences and behavioural outcomes for the child, it is not explicit in their discussions of parental goals.

In principle, it is possible that some parents may not have any goals for their children, but in practice this is hard to imagine. Since motivation is goal-directed attention, goals are necessary for motivation. Parenting action is any action by a parent that relates in any way to the child. For any kind of parenting action to take place, however minimal or passive, or pro- or anti-social, there must be motivation (attention oriented toward a goal) in order to initiate this action. Therefore, it is a safe assumption that parents have some kind of goal for their child.

Almost all parents are motivated, at least to some degree, to care for their children and keep them safe from harm, and to ensure that they develop pro-social values and healthy social lives (e.g., Bornstein, 2008; Maslow, 1954; Solomon, 2013; Warr, 1993; Wikström, Oberwittler, et al., 2012). In evolutionary biology there is evidence for a neurological mechanism by which humans are inclined to strive for not only self-preservation, but for the well-being of 'allied selves' such as offspring (Churchland, 2011). In more specific terms than survival and well-being, it appears that although parents vary in the level of aspirations they have for their child, there is still broad agreement about the direction, content and baseline of those aspirations. For example, mothers of boys in the Cambridge Study of Delinquent Development ranged in their aspirations, wanting their sons to work in jobs ranging from unskilled to professional or white-collar positions. This variation was due in part to realistic expectation, yet the parents still exhibited a baseline ambition for their child: even those mothers reporting low aspirations had some aspiration for

their son's employment (as opposed to unemployment) (interpreted using findings by West & Farrington, 1973, pp. 67-68 and 59).

What about parental goals in relation to crime? Variants of cultural deviance theory (e.g., Cloward & Ohlin, 1960; Miller, 1958; Shaw, 1930) remind us that not all parents hold values that are in line with the law, and that these values may actually be conducive to crime; there is even evidence suggesting that some parents actually approve of crime by their children (for a discussion, see, e.g., Hirschi (2008 [1969], p.94). However, in the study used in this thesis (PADS+, see section 8.1:) almost all parents (99.5%) reported that it is very important that their children are well behaved and stay out of trouble with the law (Wikström, Oberwittler, et al., 2012, pp. 275-276). This data shows that at a broad level there is little variation in the content of (offending relevant) parental goals for their children.[16] Parents of offenders report a kind of pro-social motivation, for example, Solomon found during interviews with offenders' parents that "most knew that it would serve their children's best interests [for them] to avoid crime – or at least to avoid punishment" (Solomon, 2013, p. 554). Even among parents who offend, crime by their children is not usually condoned or encouraged (Hirschi, 1969; Warr, 1993; Wilson & Herrnstein, 1985), even if it is more likely (Farrington, Coid, & Murray, 2009; Farrington & Welsh, 2006). Fans of the fictional TV series 'The Sopranos' will recognise the attitude of mafia boss Tony Soprano towards his young son in this description.

In short, in relation to crime prevention, most parents have pro-social goals of avoiding their child becoming and being an offender, and relatedly, of preventing the child from offending. The first of these goals relates to development (of criminality), the second to action (acts of crime).

Perhaps more common than parents with anti-social aspirations for their child, are parents with ambivalent aspirations or weakly held goals. For example, parents who don't seem to care that their child is exhibiting anti-social behaviour, or parents who don't seem too bothered that their child is not meeting their pro-social development goals are perhaps not unusual (though maybe not as common as sensationalist media reports would have us believe). The strength of motivation may determine the efficacy of the action process, for example, weak motivation is one reason 'motivated' parents might not act (e.g., to monitor their offspring; see further section 4.2.3.2:). However, the process itself remains the same irrespective of the strength with which goals are held.

[16] It is possible that the specific nature of the goal may vary; for example, conceptually a child 'being well-behaved' and a child 'not getting into trouble' are different things (despite being combined in the PADS+ measure reported above), but the target behavioural outcome may still be the same (e.g., one way to not get into trouble is to not offend).

Anti-social goals and weakly held aspirations are examples of factors relevant to parental motivation that may relate positively to a child's prime propensity and acts of crime, however, the *process* by which these factors may influence developmental and behavioural outcomes in the child are the same as for factors such as pro-social goals and strongly held aspirations. Moralistic judgements as to whether goals are pro- or anti-social, or positive or negative, are irrelevant.[17] For example, whether a parent aims for their child to avoid offending, become a virtuoso pianist, be a kind person, excel at burglary, drop out of school, or be a bully; the parenting process remains the same. A desire for their child to not offend directs parents' attention toward achieving this goal, though the reverse is also the case: a desire for an offending child directs parents' attention towards achieving *this* goal. The *content* of the goal, the *content* of the means employed to achieve it and the *content* of the monitoring process would be quite different in these two cases, but the *process* itself remains the same.

This means that although considerations of the content and strength of parental motivations are crucial for the specific nature of parenting actions and potentially whether a child offends or not, they are irrelevant to discussion of the specifics of the mechanism by which this occurs. Therefore, parents' desire for pro-social outcomes, and specifically for a non-offending child, will be assumed for the purposes of parsimony in this thesis (see also, Wikström et al 2012, p.275-276). This assumption of parents' pro-social goals for their children is purely for ease of illustration and not for explanatory purposes. Proposed mechanisms of the parenting process are introduced in the following section, and can be applied to any parenting goal or strength of aspiration.

4.2.3: Goal-directed parental action

> *"Parents have different goals and they appear to adopt different strategies to achieve those goals… asking what effective parenting entails must also include a consideration of what the parent is trying to achieve"*
>
> (Grusec, 2008, p. 242)

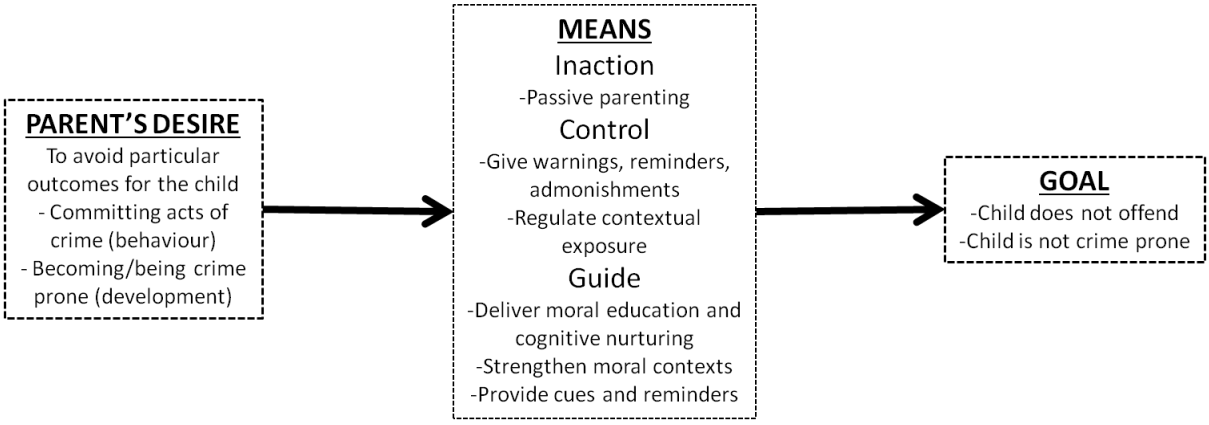
> *"Parenting is defined in terms of its propensity to move children toward those goals that the culture deems important"*
>
> (Bornstein, 2008, p. 266)

> *"People choose actions that they think will achieve their goals. The goals parents seek may influence the repertoire of response options they activate and the decision rules they use to decide which option is preferred"*
>
> (Dix, 1992, p. 336)

[17] For example, Hirschi's (1969) problematic conceptualisation of 'conventionality' makes unnecessary assertions about who makes the rules and their legitimacy (Treiber, Forthcoming).

Goals and goal-directed action (motivation) frame the model of parenting presented in this chapter. As presented here, this model is applied specifically to the long- and short-term parenting goals of i) raising a non-offending child or ii) their child not offending in a particular situation, but this model of parental action can be applied to any parenting goal (section 4.2.2.1:). The following section describes the initial model of goal-directed parental action presented in Figure 2, and further sections describe, explain, and detail the extended model which situates parental monitoring (and associated factors) within this goal-directed parenting process (depicted in Figure 3 and Figure 4).

Figure 2: Model of goal-directed parental action



Parents can use none, any, some, or all of a range of deliberate (active) means to attempt to satisfy the parenting goal (Figure 2).[18] These are parental actions (parenting), including inaction (passive parenting). The content of the parenting goals in this case relate to the prevention of crime (either by preventing acts of crime by their children or, preventing their children from being crime prone). The content of the parenting goal influences the content of the means, and these means can be categorised into parenting behaviours that control or guide. The model of parental action presented in this chapter distinguishes these parental actions (means) from motivations, goals and monitoring; whereas most definitions of monitoring (including those in dictionaries) conflate these concepts.

[18] This is similar to part of Darling and Steinberg's 'contextual model of parenting style' (1993, p. 493) whereby parental goals and values influence parenting practices which have a direct effect on specific developmental outcomes for the child. Both Darling and Steinberg's model and that in Figure 2 explicitly disentangle parenting goals and parenting practices. The model introduced in Figure 2 and developed in later figures is designed to specifically situate parental monitoring, whereas Darling and Steinberg's contextual model of parenting style is designed to situate a similar model of parental motivation and action within the context of parenting style. Thus, these models are not mutually exclusive because parenting style can provide a context (as described by Darling and Steinberg) for the parenting model (including the role of parental monitoring) specified in this chapter. Further, this model allows for parental goals that relate to both their child's development and their specific actions.

4.2.3.1: Parenting actions: guidance and control

In the case of parenting goals relating to the prevention of crime, these parenting behaviours broadly represent i) control (e.g., warnings, punishment and threats of punishment, physical controls, regulation of activities and friends) and ii) guidance (e.g., guiding socialisation processes including moral education; delivering guidance, reminders, advice and instructions; providing support and cognitive nurturing; strengthening the moral content of contexts). These themes of control and guidance are discussed in chapter 3 with regards parenting behaviours that control or guide; but also in chapters 5 and 6 with regards to parental influence on adolescent outcomes that control or guide their behaviour. Many of the parenting behaviours listed here as means to satisfy goals are included in dictionary definitions of monitoring, but their role is not made clear because the concepts of means, motivation, goals, and monitoring are not distinguished from one another. These active parenting behaviours are often the subject of much research, though the proposed mechanisms by which these may influence the outcome are commonly poorly specified or are conflated with other parts of the parenting process (see chapter 4). Conceptualisations and operationalisations of parental monitoring that include the means (actions) by which parents achieve parenting goals conflate the means with the monitoring and evaluation process (which is separate, see section 4.2.4:). For example, by describing the "essential functioning dynamic of the monitoring construct" as "parents' active structuring, tracking, and efforts to be aware of and reduce negative social influences" (Dishion et al., 2003, p. 557), Dishion et al. conflate the means (i.e., 'reduce negative social influences') with the monitoring process (i.e., 'active structuring, tracking, and efforts to be aware of'). Similarly, many of the active parenting behaviours included in varied descriptions of monitoring presented in section 4.1: are actually rather the means of reaching parental goals. The model of goal-directed parental action presented in this chapter specifically defines components to precisely distinguish parenting means to achieve goals (such as behaviours that broadly represent control and guidance) from parental monitoring.[19]

As well as active parenting behaviours, a parental response to the motivation of a parental goal may be inaction. One reason for this inaction may be that parenting action is not, or not perceived to be, required to meet the goal (see section 4.2.4:). The following section describes factors that may influence the degree and content of action, and inaction.

[19] Situational Action Theory is a theory of action that emphasises distinctions between the concepts of control and guidance, but also between the social and situational processes which explain and differentiate the ways in which such varied parenting behaviours can influence adolescent action and development and prevent crime. Integrating SAT with the nascent model of goal-directed parental action presented here would provide a powerful new model of parenting, but is beyond the scope of this thesis.

4.2.3.2: Causes of the causes: Factors influencing parenting action and inaction

> *"Motivation initiates the action process. However, motivation does not explain why a person behaves as he or she does. Motivation is a necessary but not sufficient factor in the explanation of why people act in one way or another"*
>
> (Wikström, 2014, p. 79)

Although in most cases parents are motivated to prevent their child becoming involved in crime, not all parents will actually act to prevent their child from becoming an offender or committing an act of crime. Although motivation is necessary for action, it is not sufficient (Wikström, 2010a, 2014). This means that even if motivated to do so, parents may not actively monitor their children because people respond differently to motivation. For the purposes of this thesis, it is assumed that most parents will respond to this motivation in some manner, though it is important to remember that the degree of action will vary. There are likely to be large parental variations in efficacy of both evaluation and response (Kerr, Stattin, & Pakalniskiene, 2008). This means that theoretical distinctions drawn between active and passive parenting are not absolute in real terms.

There are many factors that may prevent, limit or influence parenting action, and many facilitators and barriers to parents' evaluative and parenting skills. These vastly wide-ranging factors vary from the individual to macro societal level, including, for example; resources in terms of skill, time and money; being a big family; being a single parent; erratic and psychopathic parental behaviour; attitudes to child-rearing; family emotional climate; parenting style; parental level of education; parent and child interpersonal skills; lack of parental interest or commitment; existing clinically high levels of child problem behaviour; barriers and facilitators to supervision (e.g., anonymous urban areas; technology). In addition, the willingness (and agency) of adolescents is crucial at various stages of the parenting process (e.g., Darling & Steinberg, 1993) and many conceptions of parenting now draw attention to the role of child temperament and the reciprocal nature of the parent-child dynamic (for example, in the volume edited by Kerr, Stattin, & Engels, 2008b).

Furthermore, Wikstrom (2006) points out that there are factors that can influence the action process that are not within the control of, nor maybe even known to, the individual. During an action process, events may occur and circumstances may change. These are termed 'interferences', defined as "unforeseen or unexpected events or interventions that force the agent to change a course of action (inaction) or that change the outcome and consequences of the action (inaction)" (Wikström, 2006, p. 76). These can occur at any step of the action process, including at the moment of motivation. These interferences, in addition to aforementioned

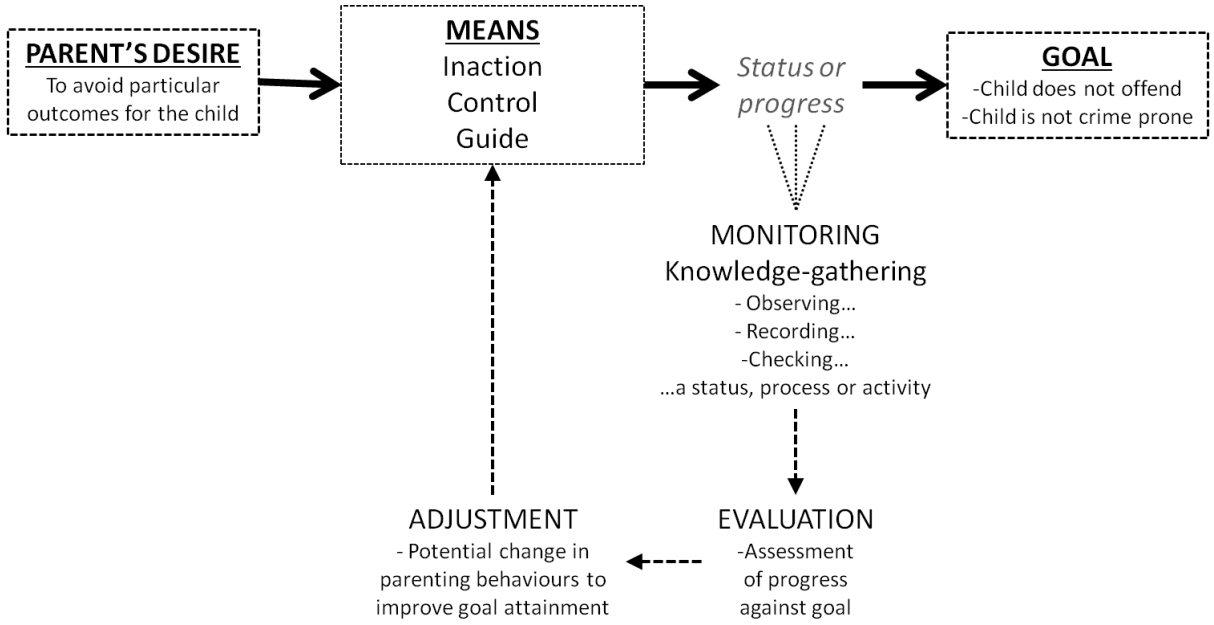
influencing factors, mean that it is possible for a parent to hold a goal but not necessarily act in accordance with the goal.

Many of these varied factors interrelate, and some may be markers for or mediators of each other. Many of these factors are often studied in relation to parenting in the literature. They may or may not play a crucial causal role in the parenting process, at varying degrees of proximity to the parenting outcome. For example, parenting action all takes place within the family context (see references to parenting literature on 'support' in section 3.2:), and the family context is embedded within wider contexts such as neighbourhoods, and larger social, economic and political systems (see, e.g., Bronfenbrenner, 1986). The nature of the relationship of these factors with parenting will not be addressed here, but the model presented in this chapter allows for future development to specify how such factors may be integrated into a framework of parental action (and in some cases may be discarded from a causal model); i.e., these factors may have indirect influence on the parenting outcome through their influence on the parts of the parenting process specified in the model. To use SAT terminology, these are 'causes of the causes' and will not be discussed further here. These factors are also not included in the simplified figures depicting the parental action process as this model of parenting is focused on describing how such factors can be disentangled and separated from parental monitoring factors, which ultimately helps to clarify what parental monitoring is, and is not.

4.2.4: Monitoring and evaluation

The model presented in Figure 3 builds on Figure 2 to situate the parenting behaviours (means to attempt to satisfy the parenting goal) as part of a parenting process which now includes parental monitoring. Crucially, unlike many definitions of parental monitoring, this model specifically defines such parenting behaviours as being distinct from parental monitoring itself.

Figure 3: Model of goal-directed parental action and the role of parental monitoring



The process of progressing toward or meeting a goal usually involves monitoring, evaluation, and if necessary, change or adjustment (Figure 3). For parental action to remain goal-directed, parents must evaluate the effectiveness of their means of meeting parental goals and on this basis potentially subsequently adjust these parenting behaviours. To evaluate in this way, parents must pay attention to the child's progress towards the end goal.[20] This attention involves collecting knowledge about a process, activity or adaptation (i.e., action or development) relating to their child and the outcome. This knowledge gathering is parental monitoring. Unlike most definitions of parental monitoring, the model presented here provides a wider context for parental monitoring as serving a parenting purpose. However, the deliberate parental information-gathering actions are those recognised as 'parental monitoring strategies' by Dishion and McMahon's definition (1998). These can include observing, asking about,[21] recording, or checking a process, adaptation or activity relating to their child. It also includes rule setting about information sharing.[22] Gathering knowledge to serve a parenting purpose is therefore at the heart of parental monitoring, and is an active parenting behaviour.

[20] Dishion and McMahon (1998) draw attention to Rogoff and Wertsch's 'scaffolding', which is the parental provision of appropriate support for children in order that they participate in tasks that will aid their development. Scaffolding employs a similar conception of monitoring and evaluation as the process presented in Figure 3, whereby parents monitor progress and adjust tasks in order to fit child competence at the developmentally beneficial task.

[21] Referred to in the literature as 'solicitation' but due to other usages of this term it is avoided here.

[22] Often referred to in the literature as 'control'. Due to potential confusion with other conceptions of control in criminology, this term is avoided in this context.

Knowledge gathering can take place with or without the permission or knowledge of the offspring, and may involve the presence of the parent. Knowledge gathering may also be contingent on others, in particular, the child themselves. Kerr, Stattin and Pakalniskiene cite a growing body of evidence that suggests that youth problem behaviour and parental knowledge are reciprocally or mutually related and conclude that "a valid understanding of parenting will have to include reciprocal relationships - how parents react to children as well as how they shape them" (2008, p. 93).

These knowledge gathering actions are carried out with varying levels of accuracy, completeness, motivation and success; and the strategies can be carried out in a range of ways and can therefore be systematic, on-going, continual, covert, in attendance, sporadic, or momentary. The specific nature of the parenting goal and the means parents have employed to meet that goal mean that the knowledge gained can vary dramatically in quality, quantity and content. In addition, by specifying the separate components of parenting, the model (Figure 3) allows for the fact that parental knowledge can come from sources other than parents' parental monitoring efforts (though this is not depicted in Figure 3. See further section 4.3:).[23] The parental knowledge (however gained) allows parents to actively evaluate their child's progress against parenting goals and if necessary, alter their parenting practices accordingly.[24]

4.2.5: Summary

The concept of (parental) monitoring presented here is embedded within a new model of goal-directed parental action. This model of goal-directed parental action does not specify other influences on child behavioural and developmental outcomes (and the interaction of these influences with the parental influences), however, it can allow for them. The model also does not include the influences of child agency and complex dynamic processes between parents and children as these are not the focus of this thesis, though the model can be developed to include these in future. In short, this model of parenting is not yet fully developed, however, it is outlined here in order to better specify what parental monitoring is, and is not.

Parental monitoring is the employment of active information-gathering behaviours by parents to help them to gain knowledge about and evaluate their child's progress towards a range of parentally selected goals (behavioural and/or developmental outcomes for the child). The new model of parenting allows for varied parental goals, the social and situational processes by which

[23] In particular, knowledge gathering is an active process, but parental knowledge can also be gained passively.
[24] As discussed in the previous section, parental knowledge facilitates this evaluation and adjustment but does not mean it will occur (see also, Kerr, Stattin, & Pakalniskiene, 2008).

children achieve these goals and therefore the many ways in which parents can assist or guide these processes, and the wide range of ways in which progress can be quantified or assessed. This conception of parental monitoring therefore also encompasses the monitoring of a wide range of processes and activities. This means that in this model, parental monitoring can refer to the monitoring (by any means, of anything or anyone) that provides evidence or information about status or progress toward the parenting goal. This is in contrast to the traditional focus of the parental monitoring literature on the monitoring of activities in particular (what activity, where and with whom) (see, e.g., Crouter & Head, 2002 for a review). Though broader in this way, the clarified and more specified conception of parental monitoring allows for the future situating of more specific factors in relation to this model, therefore facilitating clarification of their role. This includes the identification of factors as causes of the causes (section 4.2.3.2:) and the specification of particular features of parental monitoring.

This thesis focuses specifically on two such features of the parenting and parental monitoring process, namely the presence of parents or other guardians (commonly subsumed under the term 'supervision') and parental knowledge. These parental monitoring-related factors have not been chosen as the focus of this study because they are the most relevant for adolescent crime; in fact, this may not be the case. They have been chosen because in the parental monitoring, criminological, and general parenting literature they are both regularly i) used inaccurately as proxies for parental monitoring, ii) poorly defined and operationalised, and iii) associated with crime but without exposition of plausible mechanisms that explain this association.

4.3: Presence of guardians, supervision and parental knowledge

Within the parental monitoring literature, parental monitoring is usually conceptualised as parents keeping track of their children's associations and activities (Kerr, Stattin, & Burk, 2010). Parental monitoring is commonly operationalised in research as either i) parental presence or supervision (e.g., the traditional research of Glueck & Glueck, 1962; McCord & McCord, 1959; West & Farrington, 1973) or ii) parental knowledge (for a review, see, Crouter & Head, 2002). These constructs have often been heavily associated with crime outcomes in the literature and the mechanisms by which this relationship occurs are neglected (see section 3.3:). Poor delineation of the wider process and how the concepts relate has facilitated this neglect of causal mechanisms. Before attempting to outline the proposed mechanisms involved (chapters 5 and 6), the remainder of this chapter defines each of these constructs and their conceptual

relationship to parental monitoring within the model of goal-directed parental action introduced above.

The words 'monitoring' and 'supervision' (and their derivatives) are commonly listed as synonyms and their dictionary definitions are almost indistinguishable, but these two terms have come to mean different things in the parenting literature:

> *"Monitoring is generally conceptualized as keeping track of youths' activities and associations when they are away from home where parents cannot supervise them directly, whereas spending time together involves direct supervision"*
>
> (Kerr et al., 2010, p. 58)

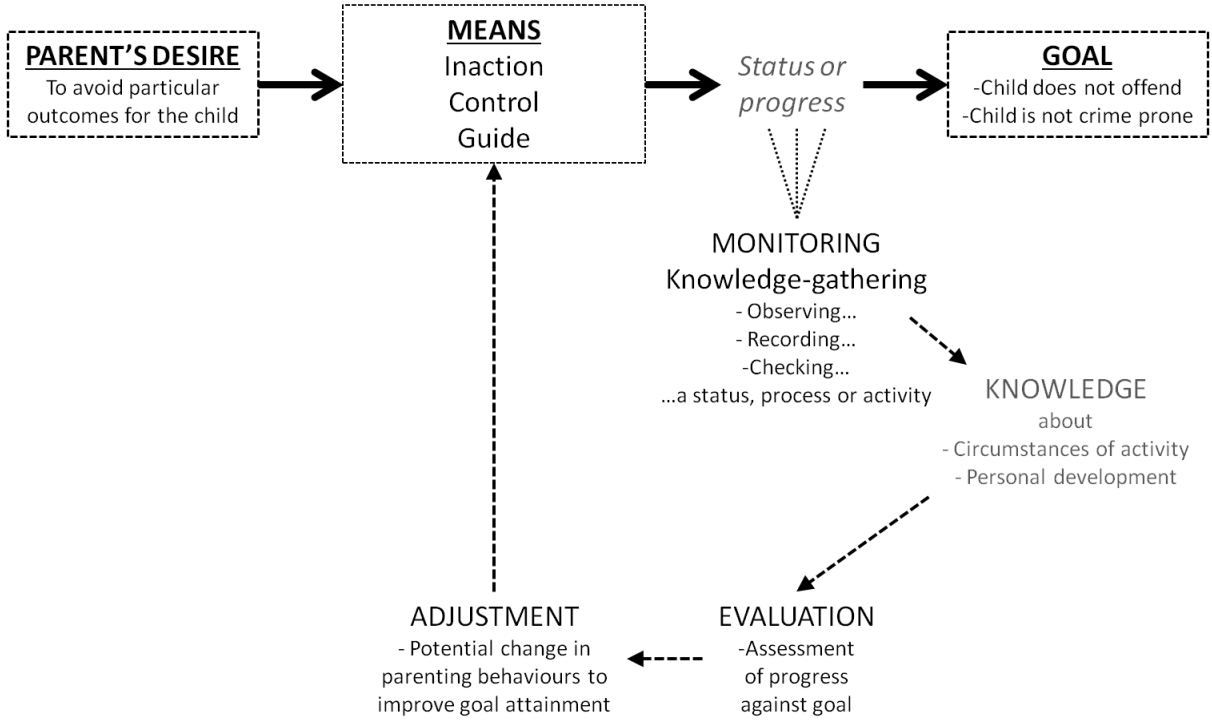
At the heart of this distinction between monitoring and supervision is the presence of the supervisor.[25] The presence inherent in supervision affords monitoring (knowledge-gathering), and also affords various means by which parents achieve their parenting goals. In this sense, parental supervision plays a role in facilitating active parenting behaviours. These active behaviours include both parental monitoring and parental means (behaviours that control or guide) to satisfy situational or developmental parenting goals. This raises the question of whether 'presence' and 'supervision' are synonymous terms. These terms are distinguished from each other in section 4.3.1:.

In contrast to parental supervision, parental knowledge does not require parental presence. The term monitoring refers to specific active parental monitoring strategies that aim to gain parental knowledge. Parental knowledge is not an action or parental monitoring strategy in itself, but is the result of active knowledge gathering carried out by parents.[26] Therefore, parental knowledge is crucial to the parenting process depicted in Figure 3, of which monitoring is a part (see Figure 4).

[25] This distinction is not universal. Even within criminology, this particular convention is restricted to the specific group of researchers working on parental monitoring. For example, within probation research, the literature on the 'supervision' of offenders is not largely about direct supervision (where the supervisor is present); instead it revolves around the themes of control and guidance or development (see, e.g., Canton, 2011) that are also apparent in parenting (section 3.2:).

[26] Parental knowledge can also be gained passively.

Figure 4: Situating parental knowledge in the model of goal-directed parental action and parental monitoring.



Within these definitions, neither parental supervision, parental presence, nor parental knowledge can be classified as parental monitoring. They are not simply synonymous with parental monitoring, as is sometimes implied by the literature, but play a specific role in the parenting process of which parental monitoring is a part. Each is discussed further in the following sections.

4.3.1: Presence and supervision

In line with the general consensus in the literature captured by Kerr et. al., (2010), parental supervision requires the presence - or near-presence - of the parent (see also, Coley & Hoffman, 1996). In empirical research, parental supervision is usually operationalised by some measure of parental presence (Dickson et al., 2015). Likewise, the presence of a guardian (not necessarily a parent) usually denotes supervision (not necessarily by a parent) (e.g., Osgood et al., 1996). Some researchers describe whether a supervisor is present or not using the terms direct and indirect supervision,[27] but more often researchers more simply equate presence with supervision.[28] Direct supervision (supervisor present) is often just referred to as supervision (e.g., Coley and Hoffman (1996) refer to 'in-person proximal contacts' as supervision). However, this section argues that

[27] In which case it is usually not clear what 'indirect supervision' is, and in what way it is similar or different to parental monitoring.
[28] This is the case for both traditional research (Glueck & Glueck, 1950; McCord, McCord, & Howard, 1963; West & Farrington, 1973) but also more recent research too (Wikström, Oberwittler, et al., 2012).

presence and supervision are not interchangeable. Although parental presence is necessary for direct parental supervision, it is not sufficient for it; supervision implies a level of activity that is more than parental presence.

In order to distinguish presence from supervision, the term 'presence' first requires clarification. There are situations when a parent is clearly present (e.g., mother and son watching television together on the sofa at home), or situations when a parent is clearly not present (e.g., parent is at work, daughter is at school); but there are also commonly occurring situations when parental presence is ambiguous (e.g., parents are downstairs at home while the child is upstairs playing computer games; parents are chatting in the park while the children are playing football some way off).[29] In reality, the boundary between 'presence' and 'absence' is not always starkly apparent, which makes defining 'supervision' potentially problematic. The concept of 'setting' helps to clear up some ambiguity about the presence or near-presence of another person. Wikström (2006) argues that an individual's actions are only influenced by the part of the social environment they access with their senses. This environment - which includes objects, persons, and events - is defined as a setting (Wikström, 2006). For parental presence to be arguably relevant for the child's actions, presence must be defined by being in the same setting. This includes being physically with them (i.e., in the same room) but can also include when they are near them but still within view or earshot (e.g., in the same house).

The first feature of presence relevant to parental monitoring is that it affords direct observation.[30] This is true of both parental presence, and the presence of another guardian. Direct observation is a knowledge-gathering strategy. The distinction between direct observation and other knowledge-gathering strategies - including indirect observation - is that direct observation requires presence. The direct observation of offspring by parents is the most straightforward and accessible way of gaining information about their child's development and activity. For example, babies, toddlers and very young children are often in the presence of parents and usually parents closely observe them to ensure that they do not come to physical harm. This means that parents (at least, those who are the main day-to-day carers for their children) can have almost perfect knowledge about their young children's safety, development, wellbeing, activities, peers, and whereabouts because they are with them almost all of the time. The following section discusses that as a result of changes and transitions in adolescence,

[29] The situations, activities and scenarios given as examples throughout this thesis are chosen because they are commonly found in the time use data collected from the teenagers used in this study.
[30] Here, 'direct observation' also includes aural observation, for example, when parents can hear their child from the next room.

parental presence typically reduces and parents are less able to gather information about their child's progress towards goals via direct observation.

The second feature of the presence of guardians is that presence affords various active behaviours by guardians. For example, as well as an opportunity for knowledge-gathering, parental presence is also an opportunity for parents to actively control and guide their offspring, as the means by which to achieve their parenting goals. This aspect of presence is not therefore a monitoring strategy, but it is implicated in the wider active parenting processes in which parental monitoring plays a part.

These features of the presence of parents and other guardians make it often very relevant to aspects of monitoring such as supervision. Action differentiates 'presence' and 'supervision'. Presence is not an active behaviour, but affords active supervision via its facilitation of active observation and active parenting behaviours (means to satisfy goals). Supervision (by parents or other guardians) implies a lot more than just presence of these guardians (see also, Osgood et al., 1996). Arguably, many conceptions of parental supervision consist of combinations of the active parenting means to achieve goals described in section 4.2.3.1:. Supervision is a nebulous and vague concept that conflates and confuses various parenting behaviours. This makes operationalisation and analysis of the concept difficult. For example, from a control perspective, Rankin and Wells refer to supervision as a "broad process" with multiple components (2006, p. 123). Although they suggest that these elements may combine in specific ways and interact in relation to behavioural outcomes (and even be bidirectional in casual efficacy; i.e., parents' behaviour also responds to that of their children), they provide little detail or specificity of what these components are or how these interrelations function. While a lack of adequate 'supervision' is a major correlate of crime (e.g., Loeber & Stouthamer-Loeber, 1986; Sampson & Laub, 1993), Rankin and Wells argue that it's not clear "which components of the broad process of "supervision" are the most effective and how they specifically operate" (2006, p. 123). Supervision entails more than parental presence, but it is not clear what.

Therefore, presence is necessary but not sufficient for supervision. It is possible for a parent to be present without parental supervision taking place; an example being when a parent is asleep and is not observing the child at all, not exerting any kind of control over the child, and not providing any kind of guidance. Since they are conceptually different, it makes sense to study supervision and presence as separate factors. The presence of a parent or other guardian conceptually alters the behavioural and developmental context of a setting (even when that

presence is extremely passive), such that even passive presence (such as being asleep) is not equitable to absence (see chapter 6).

This section has delineated the two affordances of parental presence (active parenting and direct observation), and distinguished presence from supervision. However, neither of these issues is explicitly acknowledged in the literature on parental supervision. This lack of specificity is perhaps to blame for disagreement in the literature about the role of supervision in parental monitoring. This disagreement is clear from Kerr al.'s statement:

> *"Spending time in direct contact with the youth is a good way for parents to know what their youth is doing, but we question whether it should be considered a monitoring strategy."*
> (Kerr et al., 2010, p. 58)

Kerr et al. do not specify the root of this disagreement, nor specify details of how it may be resolved. The model developed in this chapter settles this disagreement by specifying that (direct) supervision is indeed not a monitoring strategy (rather a set of means to satisfy a parenting goal), but supervision (via parental presence) does afford monitoring. This distinction is often confused in the literature.

There is potential for large variation in both the content and quality of supervision which makes it very difficult to adequately quantify.[31] By contrast, parental presence is conceptually simpler and therefore easier to capture methodologically. Although it is often used as such in parental monitoring research, parental presence is not a sufficient proxy for parental supervision. However, parental presence may be crucial to the parenting and parental monitoring process and child developmental and behavioural outcomes. Parental presence arguably alters the developmental and behavioural context and also affords supervision. Parental presence and the supervision it affords may influence adolescent development and action via a number of mechanisms. This includes the role it may play in both developmental and situational processes, the latter of which is the focus of this thesis (see chapters 5 and 6). This means that parental presence rather than parental supervision is the focus of this thesis. The following section introduces the fact that parents often trust some nominally, formally or informally appointed adults as their proxy, to bridge the gap between parental presence and being unsupervised. This means that the study of the presence of guardians other than parents is also included in this thesis.

[31] Although a potentially fruitful area for research into the impact of parental supervision on behaviour and the mechanisms by which this may occur, the quality of supervision will not be further discussed here (see further, chapter 11).

4.3.2: Parental monitoring and adolescent transition

> *"Parental monitoring, broadly defined, is a skill that is relevant to parenting from infancy through adolescence, and perhaps even into young adulthood. Although the specific methods and foci of monitoring change at different developmental periods, the function of these activities is essentially the same".*
>
> (Dishion & McMahon, 1998, p. 65)

> *"During childhood, parental monitoring takes place mostly within the context of the home and school. As the child grows into adolescence and young adulthood, parents must adjust their techniques to monitor the teenager's unsupervised activities with peers and within the broader community"*
>
> (Racz & McMahon, 2011, p. 378)

The changes and transitions inherent in adolescence are briefly summarised in section 3.1:. These have impact upon parental supervision, parental presence and parental knowledge. The direct observation afforded by parental presence is a direct source of parental knowledge and as a result, information gained via parental presence is particularly rich and accurate. However, as with parental monitoring strategies and indeed all parenting behaviours, parental presence varies in quantity over time, and the parental supervision it affords varies in its content and quality across settings, time, children, parents, family context, cultures, and history. In particular, due to the challenges and transitions inherent in the short period of adolescence, the child's age is a key factor in the quantity of parental presence and the quality and content of both parental knowledge and parental supervision.[32]

In early childhood, parental monitoring is essentially dependent on parental presence. The parental knowledge gathering strategy almost exclusively used is direct because it involves observation. The link between the monitoring strategy (direct observation) and the parenting goal (e.g., keeping the child safe) is very direct in very early childhood.[33] Older children raise less immediate health and safety concerns, and parents learn this by evaluating the information collected during periods of direct observation (among other sources). Parents therefore learn that they can, for example, leave the room briefly while toddlers are in the bath, playing, or watching television and control and guide them less directly. As children age, parents can leave them unattended for longer periods of time and parenting goals (e.g., safety of the child) are reached with less direct guidance from and involvement by the parent. These examples show

[32] Presence cannot vary in quality, there is only a binary distinction between presence and absence (see further, section 8.2.2.2:).

[33] For example, parental supervision of babies is usually intense and continual because the information that the observation affords helps parents to evaluate and conclude that the child would not be safe without various parenting behaviours involving control and guidance.

variations in parental supervision (in terms of intensity and also the proximity of supervisor to supervisee) that are primarily directly related to the age of the child.

In addition to this age-related decrease in supervision intensity and proximity of parents, older children are increasingly supervised by and/or in the presence of someone other than a parent, and eventually, increasingly unsupervised. As babies and children age they spend less time being directly supervised by their parents. For example, financial or social pressures mean parents return to work, societal expectation means children start to attend compulsory education and maybe preschool before that, and increasing autonomy means adolescents have more experiences outside of the family. The increasing autonomy and communion with others (particularly peers) characterised by adolescence is introduced in section 3.1:. These changes mean that older children and adolescents are expected to become more responsible for themselves and can be left unsupervised for longer periods of time, and have growing discretionary time (when they can decide what to do/ where to go, and with whom). Studies show that unsupervised time increases by age during adolescence (Laird, Pettit, Dodge, et al., 2003; Larson et al., 1996; Patterson & Stouthamer-Loeber, 1984; Wikström, Oberwittler, et al., 2012).

4.3.2.1: Other guardians

Particularly when children and adolescents are younger, they rarely spend time unsupervised but regularly parents trust people other than themselves to supervise their children, often for long periods of time. For example, Wikström et al. (2012) found that although young people are in the presence of a supervisory figure for around three quarters of the time they spend awake (see also, Wikström & Butterworth, 2006), less than half of their time awake was spent in family oriented activity and "for most of the school day, young people in the PADS+ sample were supervised by teachers and other staff members" (Wikström, Oberwittler, et al., 2012, p. 277). Children and adolescents spend a lot of time with supervisors other than their parents, such as childcare figures (e.g., babysitter, child-minder, and nursery staff), school teachers, employers, extended family and the parents of friends.[34]

When children are being supervised by others this is often because the parents have (often but not always intentionally and formally) passed responsibility for the child over to another guardian. In this sense the other guardian is a proxy parent (or 'assigned handler', see, Felson, 1995). Perhaps due to differing levels of either attachment (e.g., Gottfredson & Hirschi, 1990),

[34] Other guardians are those who may be formally or informally charged with or assumed to have some level of (even nominal) responsibility for a young person. Section 8.2.2.2: details the operationalisation of this concept.

or responsibility (e.g., Clarke, 1992; Felson, 1995), the parent and the proxy may be differentially invested in the behavioural and developmental outcomes of the child. This means that the nature and strength of the motivation for behaviours that will help that child meet outcome goals may differ between parents and their proxies. Although there may be exceptions, we would expect in most cases that the presence of other guardians (such as proxy parents) to bridge the gap between parental presence and being unsupervised.[35] The presence of other guardians can also bridge the gap between unsupervised time and time spent in the presence of parents in terms of the likelihood of detection (deterrence mechanisms are discussed in chapters 5 and 6) because guardians can act as informants; the less proximal the guardian, the less effective an informant they are (Felson, 1994, 1995).

4.3.2.2: Sources of parental knowledge in transition

Irrespective of decreasing time spent in the presence of parents or even any guardian, parents remain concerned for the wellbeing, health and safety of their child (see section 4.2.2:). Parenting behaviours, including parental monitoring, are still an important part of parents achieving safe, happy, well adjusted, trouble-free offspring. When children are being supervised by their parents, parents know what their children are up to because they are present, or at least, for example, in the same house. The reduction in parental supervision and therefore direct observation as their children age into adolescence means that parents lose their main source of knowledge and must start to gain information about the activities of their offspring without being physically present (Dishion & McMahon, 1998; Kerr et al., 2010; Martens, 1997; Racz & McMahon, 2011).[36]

The presence of other guardians is a key source of parental knowledge. When they are in the presence of other guardians (e.g., teacher, friend's parent, other adult guardian such as sports coach or employer), parents have or are usually able to gain knowledge about their children's activities by various means. Parents can gain parental knowledge about their child's activities, movements and companions from these guardians actively (by asking them directly; solicitation) or passively (by being informed). As is the case for parental supervision, the quality and intensity

[35] In some cases (for example when social care workers or foster parents are responsible for the children of neglectful parents), the strength of motivation may be stronger in proxy parents, and even the goals may differ.

[36] Regardless of the transition in the source of parental knowledge from direct observation (facilitated by parental presence) to other sources, parental knowledge still decreases with age as a young person's activity outside the home increases during adolescence (Keijsers et al., 2010; Kerr et al., 2010; Padilla-Walker, Nelson, Madsen, & Barry, 2008). However, changes in parental monitoring that result from the changes inherent in the transitional period of adolescence need not necessarily be criminogenic. For example, Janssen et al. (2014) found that as adolescents age, a decrease in their parents requiring them to ask permission before an activity and actively seeking information afterwards does not result in an increase in the amount of time spent in criminogenic settings by the adolescent and may be entirely normative, whereas decreases during adolescence in the quality of parent-child relationships and a reduction of limit-setting (a form of parental control) did result in potentially criminogenic changes in exposure to criminogenic settings.

of the supervision by others may vary, and in some cases the young person may not be supervised or even in the presence of a guardian when their parent thinks they are (e.g., truancy). Although this 'second hand' knowledge is potentially less accurate, such inaccuracy may not affect the efficacy with which parental knowledge may impact upon a child's behaviour (for a discussion of perceived as opposed to actual parental knowledge, see section 4.3.3.1:). Furthermore, much supervision by others takes place in controlled or structured environments (e.g., school) where information is routinely fed back or available to parents and the potential for inaccuracies are reduced.

When their children are unsupervised (i.e., not in the presence of any guardian), parents must find other sources of parental knowledge about what the young person is doing, where they are and who they are with in order to continue to monitor their children. Parents must therefore either actively gain information from their children, or rely on them for spontaneous disclosure.[37]

Parents can make requests or demands for information from their children. These antecedents of information are referred to as solicitation and control in the parental monitoring literature, and constitute modern measures of active parental monitoring efforts (see, e.g., Kerr, Stattin, & Pakalniskiene, 2008; Stattin & Kerr, 2000). These measures typically capture whether parents ask or demand that their children check with them before they make plans and keep them updated with information about their activities, movements and companions. For many parents, this could be a condition of the activity taking place or the child's participation in it. In the real world this information request and provision can be immediate (e.g., "where are you?"), agreed in advance (e.g., "who is going to the party tonight?"), or on the young person's return (e.g., "what did you get up to today?"). The communication can be face to face, or by phone, text, or email. Questions can be generalised (e.g., "what sort of things do you do with your friends?") or specific (e.g., "have you been drinking?").

Children can inform their parents about various aspects of their lifestyles with or without having been asked (spontaneous child disclosure). The parent-child relationship, family context and parenting styles all may be relevant to both the success of the solicitation-disclosure process, and the quality and quantity of lifestyle information spontaneously disclosed by children to their

[37] In addition, a certain amount of knowledge is available incidentally. For example, parents may know that their child is at the cinema with two friends because they provided the transport. Incidental information may be actively recorded by parents as part of the parental monitoring process; however incidental knowledge of activities, companions and whereabouts may only be correct at a certain point in time (e.g., the child may move or circumstances change without the parent's knowledge). As adolescents become more and more independent (maybe with increased mobility and resources) and spend more of their discretionary time outside the home (perhaps with a broader peer-group) the potential for accurate incidental knowledge decreases.

parents (see, e.g., Tilton-Weaver et al., 2010). Mutual trust and agreement, facilitated by effective listening and good quality conversation are crucial to this process as children age and parental knowledge becomes underpinned by mutual trust rather than direct supervision methods of knowledge gathering (Dishion & McMahon, 1998; Laird, Pettit, Dodge, et al., 2003).

Adolescence is a period that represents a transition from parental knowledge that is primarily gained from direct observation facilitated by parental presence to that gained primarily via other means. Presumably, it is because of this shift that studies of parental knowledge in adolescence often conceptualise parental knowledge with reference only to activities when parents and/or other guardians are not present. These measures of parental knowledge thus exclude parental knowledge gained by direct observation during parental presence, such as that gained during supervision. Both the presence of guardians and parental knowledge about unsupervised activities are relevant to parental monitoring in adolescence, though the mechanisms by which they influence behaviour may be different.

4.3.3: Parental knowledge

> *"What parents know is more a function of what youths tell them than what they try to find out by monitoring. There is little in these results to suggest that monitoring efforts provide parents with knowledge or act protectively to reduce delinquency"*
>
> (Kerr et al., 2010, p. 57)

> *"This should not be mistaken for the claim that parents are unimportant. Parental knowledge and youth disclosure are robustly linked to delinquency and other forms of internal and external adjustment. There must be mechanisms not yet considered or tested that explain the role of parents and that suggest what they might best do to guide their children through adolescence into adulthood"*
>
> (Kerr et al., 2010, p. 62)

Semantically, parental knowledge is information relating to their child that is known by parents. This knowledge can refer to a wide range of topics (see, e.g., Grusec, 2008). Broadly speaking, parental knowledge relevant to parenting goals regarding crime and the criminal justice system can be categorised as i) knowledge about the child's development (e.g., the child's moral development and growing decision-making abilities), or ii) knowledge about the circumstances of their contexts and activities. These kinds of content of parental knowledge are in line with the means by which parents attempt to achieve the parenting goals (Figure 4). These also reflect the parenting themes introduced in chapter 3 and correspond to the roles parents can play in both the social and situational models of SAT.

Dishion and McMahon's (1998) oft-used definition of parental monitoring (stated above in section 4.2.1:) captures both these topics of parental knowledge by reference to both i) 'adaptations' and ii) 'whereabouts' and 'activities'. It is apparent from a review of the literature (Crouter & Head, 2002) that it is the latter of these kinds of parental knowledge that dominated research in the last century. Most measures of parental knowledge capture knowledge of the circumstances of activities when the child is not with the parents, or unsupervised, therefore, knowledge gained by direct observation (involving presence of a parent or other guardian) is usually excluded.

Poor definition and confounding of parental monitoring and parental knowledge prior to the turn of the century means that many studies treated a measure of how much information parents have (parental knowledge) about their child's activities, companions and whereabouts as a proxy for parental monitoring (e.g., Brown, Mounts, Lamborn, & Steinberg, 1993; Cernkovich & Giordano, 1987; Crouter, MacDermid, McHale, & Perry-Jenkins, 1990; Dishion & McMahon, 1998; Dishion, Patterson, Stoolmiller, & Skinner, 1991; Patterson & Stouthamer-Loeber, 1984; Weintraub & Gold, 1991).[38]

In contrast, the model presented in this chapter (Figure 4) makes clear that parental monitoring is the act of knowledge gathering (as a means to evaluate the progress towards a parental goal), and parental knowledge is not an act in itself.[39] One of the key problems for studies that measure parental knowledge as a direct proxy for parental monitoring is that the essential requirement of parental action is not met. In their seminal reappraisal of parental monitoring at the turn of the century, Kerr and Stattin conclude from the literature at that time that "parental action cannot be assumed in monitoring, because the measures that are most commonly used do not address what parents do, only what they know" (Kerr & Stattin, 2000, p. 266; see also Stattin & Kerr, 2000). Capturing parental knowledge as a proxy for parental monitoring is not sufficient and therefore parental monitoring cannot be assumed on the basis of parental knowledge alone.[40]

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[38] These studies include questions such as 'How often do your parents know where you are in the afternoon after school?', 'How much do your parents know about where you go when you are with friends in the evening?' 'How often does your mother/father know what you are doing when you are away from home?' 'Do your parents know who your friends really are?' Some of these studies also include a question assessing parental knowledge of what their children spend their money on (i.e., Brown et al., 1993; Dishion et al., 1991; Patterson & Stouthamer-Loeber, 1984); presumably as a proxy for knowledge about activities (e.g., entertainment, substance use etc.)

[39] Others acknowledge that parental knowledge does not represent active parenting, but do not specify what it is instead. For example, in a meta-analysis classification of parenting variables, parental knowledge was classified as 'indirect parenting behaviour' to distinguish it from other active parenting variables (Hoeve et al., 2009).

[40] Although he did not address the issue tackled by Stattin and Kerr, Martens presents findings consistent with their conclusion: He found two distinct factors of parental monitoring, one referring to parental knowledge of activities (regardless of the source), and the other to parental concern and requirements for information (which can be thought of as parental interest and action) (Martens, 1997).

Stattin and Kerr's seminal work effectively rid the literature of the assumption that parental knowledge is the outcome of active information-gathering strategies (i.e., parental monitoring) (Kerr & Stattin, 2000; Stattin & Kerr, 2000). They highlighted that in addition to active parental monitoring, parental knowledge can also be gained via passive means. Since parental monitoring involves action of the part of the parent and parental knowledge can be gained passively, parental monitoring is not necessary for parental knowledge. As Kerr and colleagues summarise, "parents can get knowledge in different ways, and not all of them involve monitoring" (Kerr et al., 2010, p. 40). For example, i) parents may become informed without asking (solicitation) about their children's behaviour and activities via direct supervision, or third party supervision such as the police or their child's school (see, e.g., Waizenhofer, Buchanan, & Jackson-Newsom, 2004); and ii) the source of much parental knowledge about lifestyles is active disclosure by the child, independent of active requests for information (solicitation) by parents and their tracking and surveillance efforts (Kerr et al., 2010; Stattin & Kerr, 2000). Adolescents are motivated to manage what their parents know (Marshall, Tilton-Weaver, & Bosdet, 2005), and they obviously heavily influence this knowledge. In fact, findings show that "parental monitoring efforts do not seem to lead to increased knowledge" (Kerr et al., 2010, p. 52).

Stattin and Kerr advocated a reinterpretation of findings published in studies using parental knowledge as a proxy for parental monitoring (Kerr & Stattin, 2000; Stattin & Kerr, 2000). Since then, there has been a "resurgence of activity" (Racz & McMahon, 2011, p. 377), focusing on relevant active parenting behaviours. It appears that parental monitoring research since the turn of the century has generally become careful not to simply equate parental knowledge with parental monitoring (e.g., Keijsers et al., 2010; Keijsers, Frijns, Branje, & Meeus, 2009; Kerr, Stattin, & Pakalniskiene, 2008; Laird, Marrero, & Sentse, 2010) and has further confirmed that parental knowledge is not a valid measure or reflection of parental monitoring efforts and often comes from other sources (Crouter, Bumpus, Davis, & McHale, 2005; Fletcher, Steinberg, & Williams-Wheeler, 2004; Kerr et al., 2010; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006; Waizenhofer et al., 2004).

There is a growing body of important research into conditions favourable for and the sources and antecedents of parental knowledge (for a discussion, see, Kerr et al., 2010).[41] As discussed in section 4.3.2.2:, other than direct observation afforded by parental presence and knowledge gained from other supervisors of their children, alternative sources of knowledge are based in

[41] Findings from research into whether levels of parental knowledge are related to family features such as elements of social deprivation are mixed, though there is some evidence that parental knowledge does vary by ethnicity, but not by gender (Wikström, Oberwittler, et al., 2012).

active requests or demands for information from children (solicitation and control), and via spontaneous child disclosure. There is also a certain amount of information available incidentally. These antecedents and sources of parental knowledge are part of the wider parenting process, but should not be conflated with parental knowledge itself, active parenting behaviours, and other parts of the process.

These developments in the literature have had profound impacts on the study of both parental monitoring, and parental knowledge. The major implication of these developments for studying the role of parental monitoring specifically in crime is that measures must capture parental monitoring strategies themselves directly, and not rely on a proxy that is the (incorrectly) presumed outcome of parental monitoring (for a discussion, see, Kerr et al., 2010; Kerr, Stattin, & Pakalniskiene, 2008).[42]

Where does this leave parental knowledge? Parental knowledge of adolescents' activities when they are unsupervised (often used to capture monitoring) has been a mainstay of studies of risk and protective factors. The dramatic changes precipitated by Stattin and Kerr's reinterpretation of parental monitoring mean that parental knowledge can no longer be simply conceptualised as a result of (or proxy for) parental monitoring. Does this mean we should abandon research into and parental knowledge and the concept altogether? The answer to this question lies in the distinction between questions of i) how the knowledge was gained and ii) what the knowledge can/may do. The ways in which parents come to have parental knowledge (and the parental action that these sources may or may not infer) are distinct from the effect that parental knowledge (and/or adolescent perception of it) may have on adolescent action. In short, parental knowledge, however gained, may still have relevance to the adolescent's behavioural and developmental outcomes.

Little is known about what parental knowledge actually represents (Kerr et al., 2010). Some researchers argue that parenting contexts and behaviours such as warmth and psychological control must be considered in order to fully understand parental knowledge (Fletcher et al., 2004; Soenens et al., 2006). Some are trying to empirically establish whether parental knowledge is primarily driven by child processes (e.g., Kerr et al., 2010), parent processes (e.g., Dishion, Nelson, & Bullock, 2004; Laird, Pettit, Bates, & Dodge, 2003), or complex reciprocal processes (see chapters in a volume edited by Kerr, Stattin, et al., 2008b). Measures that capture parents'

[42] Kerr et al., (2010) suggest that studies may exist that have captured parental monitoring strategies directly in order to study the impact on outcomes, but that they may have not been published due to the 'file drawer' problem affecting the reduced likelihood of publication of null findings.

active knowledge gathering strategies (parental monitoring) are much improved (Kerr, Stattin, & Pakalniskiene, 2008). This kind of research will help to understand what parental knowledge is and what it represents.

This kind of research into the nature, sources and antecedents of parental knowledge should continue. However, simultaneously, research into the implications of parental knowledge for behavioural outcomes should also continue. What is lacking in the parental monitoring literature is detailed and specific theory about and empirical evidence for the mechanisms by which parental knowledge is relevant to adolescent action. This lack of mechanisms must be addressed in order to start to understand the role of parental knowledge in adolescent crime. Within an SAT framework, both long-term developmental processes and short-term situational processes can encompass plausible mechanisms to link parental knowledge and adolescence offending. Studying the situational mechanism by which parental knowledge affects crime outcomes is one of the primary empirical aims of this thesis.

4.3.3.1: Adolescent-perceived parental knowledge of the circumstances of activity

Knowledge refers to information held about a reality (i.e., fact). Parental knowledge of the circumstances of the child's activity therefore cannot be measured without capturing and cross-referencing (for each unsupervised activity) both the circumstances of the adolescent's actual activities and the information the parent holds about these. This would require a complex and costly research design which means that the accuracy of parental knowledge is rarely tested. Researchers do not line up whether the knowledge the parents have is factually correct, i.e., whether children are where parents think they are, are with whom parents think they are, and are doing what parents think they are doing.

Instead, measures of parental knowledge typically capture a *perception* of the level of parental knowledge of the circumstances of the adolescent's activities. Parents, their children, and third parties may all independently perceive the level of parental knowledge, which can therefore lead to multiple measures that capture these different forms of perceived parental knowledge. Like all perceptions, perceptions of the reality of parental knowledge may of course be flawed. For example, a parent may think they have accurate knowledge but are mistaken (e.g., they have been actively misled or poorly informed by their child or a third party), or an adolescent may be mistaken in thinking their parents don't know the details of their activity when actually they do (e.g., the parents have undertaken secret surveillance or have sources of knowledge unknown to the child, or do not believe their child's disclosures). This means that parents and their offspring

may disagree as to the level of knowledge they believe the parent to have,[43] and there is no guarantee of knowledge accuracy (i.e., relative to the reality of the activity).[44]

It is important to use the measure that is most suited to the research question and analytical approach (see also, Dishion & McMahon, 1998). This is because the mechanism in which these different measures may be implicated could be quite different. For example, actual parental knowledge may be a marker for factors (e.g., parent-child relations, child disclosure or parental monitoring efforts) that may be relevant to processes of social emergence and social selection which impact upon crime propensity and criminogenic exposure respectively (section 5.2:). By contrast, this study focuses on the young person's *perception* of their parent's knowledge as that is more relevant than either the parent's perception of their own knowledge, or the objective accuracy of the parental knowledge, for the situational process that leads to action (see chapter 6).

4.4: Summary

Specification of concepts is crucial to theoretical development and empirical testing (and replicability). This chapter introduced a new goal-directed parenting process that allows us to conceptualise, situate and distinguish various features, factors and measures that are often ignored or conflated. These are parental goals, the means to achieve those goals (which includes such parenting behaviours as those encompassed within the concept of supervision), the monitoring and evaluation process, and parental knowledge.[45] By contrast, existing research on parental monitoring and supervision is plagued by poor definitions and a lack of theoretical discussion, resulting in commonly used but poorly conceptualised measures of parental knowledge (as a proxy for monitoring) and the presence of parents or other guardians (as a

[43] Evidence shows that the perceptions of parental monitoring factors (including parental knowledge) by different people differ. Typically, adolescents report that their parents engage in less monitoring activities than parents themselves report (Keijsers et al., 2009; Laird et al., 2010). Parents' and adolescents' reports of family processes are often only modestly correlated (Gonzales, Cauce, & Mason, 1996; Krohn, Stern, Thornberry, & Jang, 1992; Laird et al., 2010; Loeber & Stouthamer-Loeber, 1986). Furthermore, parental monitoring factors as perceived by different people relate differently to crime outcomes. For example, Dishion and Patterson (2006) found that child reports of parenting practices predict anti-social outcomes better than parental recall or reconstruction, and third party reports of parenting predict anti-social outcomes the best.

[44] The content, quantity, quality, and source of parental knowledge changes over time with the age of the child, however, it is likely to also vary according to the young person themselves, the parents and their parenting styles, and the wider contexts of the family, society, and also history (e.g., parents may in general know more or less now than historically). For example, child disclosure, whether spontaneous or in response to active solicitation by parents, provides an opportunity for the child themselves to influence the quantity and accuracy of parental knowledge (Frijns, Keijsers, Branje, & Meeus, 2010; Keijsers et al., 2010; Keijsers et al., 2009; Kerr, Stattin, & Trost, 1999; Smetana, Metzger, Gettman, & Campione-Barr, 2006).

[45] This model of parenting is not completely specified here, but developed specifically for the purpose of defining what parental monitoring is, and is not (see further, section 4.2.5:).

proxy for supervision). Whilst the literature has begun to better conceptualise and operationalise active parental monitoring strategies, this positive development could result in a move away from the study of factors such as adolescent-perceived parental knowledge of the circumstances of activities and parental presence which have traditionally dominated the literature due to their consistent association with offending outcomes. Although implicated in the parental monitoring process, neither of these factors are active parenting behaviours and neither capture parental monitoring. However, this redefinition doesn't change the fact of their association with crime, only how we might conceive of their role in the causal process. By not focussing on parental monitoring efforts, but specifically adolescent-perceived parental knowledge and the presence of parents and other guardians, this thesis aims to contribute to knowledge about the specific mechanisms by which these factors influence adolescent crime. The following chapter (chapter 5) focuses on conceptions of these mechanisms in the parental monitoring and crime literature.

5 Studying parental monitoring and crime: Bringing order into chaos

This chapter argues that existing theoretical and empirical approaches to the study of parental monitoring are inadequate for explaining acts of crime. In line with problems identified in criminological theorising generally (chapters 1 and 2), most theories and empirical studies of parental monitoring and its associated features are predicated on a fundamentally flawed conception of human behaviour, and often aim to predict crime rather than specify a model of action that adequately explains crime. Most studies of parental monitoring and crime propose (or imply) that parenting behaviours influence internal or external controls that predict either criminality or criminogeneity. Whilst the parental monitoring and crime literature contains some useful concepts and relevant evidence, these are usually fragmented, incomplete or vague. In general, the literature does not detail nor provide evidence for the specifics of mechanisms that plausibly and fully explain why and how such variables as the presence of parents or other guardians, and parental knowledge of the circumstances of activity, causally influence acts of crime.

In the light of this general criticism of the broad approaches, and specific problems with the particular mechanisms and processes they champion or imply; the mechanisms proposed and tested in this thesis do not stem from the existing literature on parental monitoring and crime. However, this is not to say that previous research and theory does not provide some context and impetus for the specification and development of the mechanisms and concepts within an SAT framework. As a general theory, SAT integrates, organises and develops ideas and concepts from many theoretical perspectives within an action theory framework. The SAT framework provides a way to organise the otherwise poorly specified and fragmented theoretical mechanisms, concepts and empirical evidence in the parental monitoring and crime literature.

5.1: Inadequacy and chaos: The literature on parental monitoring and crime

> *"Each theory identifies an important variable or process in the production of deviant behaviour, but each also fails to capture the larger dynamics."*
>
> (Tittle, 1995, p. 52)

Much as there is an 'overwhelming abundance' of theories about the causes of crime (Bruinsma, 2016, p. 2; see also, Tittle, 1995; Wikström, Oberwittler, et al., 2012); there are myriad 'theories' about the role of parental monitoring in adolescent outcomes. This thesis aims to contribute to explaining the role of parental knowledge and the presence of guardians in acts that break moral rules (specifically, those defined in law; i.e., crimes). Before organising the literature within the SAT framework, this chapter first reduces the literature to that which is relevant and then classifies it according to the (sometimes implicit) overarching approach.

Definitions and distinctions developed in Chapter 4 help classify the literature by topic (e.g., monitoring, supervision, presence and knowledge) and imply that mechanisms by which these different parenting behaviours and features are related to adolescent behavioural outcomes may differ. In addition, much research into parental monitoring and related factors is concerned with behavioural outcomes other than crime (for reviews see, Crouter & Head, 2002; Dishion & McMahon, 1998). The process that leads to acts of crime is not necessarily similar to and probably often entirely different to processes that result in outcomes of a different nature (see section 3.1). This means that although potentially of some indirect relevance, research findings about various features of parenting and adolescent outcomes other than crime must be interpreted carefully (if at all) for evidence of mechanisms that link parental knowledge and the presence of guardians with crime.

The literature on the link between parental monitoring related factors and only crime outcomes still provide a bewildering array of perspectives, mediating variables and mechanisms.[1] Like most theoretical ideas and empirical research in criminology, this research can be classified according to the main ideas and perspectives in the field.[2] Many studies do not explicitly advocate a

[1] The literature discussed in this chapter is not limited to that which is concerned with the link between the presence of guardians and crime or between parental knowledge and crime. Although these are the specific focus of this thesis, lack of conceptual and operational specificity (see chapter 4) means that it is useful to include literature on parental monitoring more generally. Conceptual issues raised in chapter 4 are relevant to how the wider parental monitoring literature is addressed within the framework of SAT in this chapter.

[2] The divisions of these main perspectives in criminology are characterised by strain, learning, labelling, control, opportunity (routine activities), social disorganisation, psychodynamics and biology (for discussion, see, Bruinsma, 2016; Tittle, 1995).

particular theoretical approach or even a specific mechanism that is being explored, but it is usually possible to identify at least a broad perspective or theoretical approach.[3]

Not all criminological theories and perspectives have had influence on the field of parental monitoring research, and some have enjoyed particular influence. Most research on parental monitoring and related features (implicitly or explicitly) adopts an underlying model of human nature that assumes that behaviour is self-interested. This means that many of the various mediators, mechanisms or ideas presented as the link between parental monitoring and crime can ultimately be broadly classified as relating to controls (as opposed to rule-guidance).

In sum, most studies or discussions of mechanisms linking parental monitoring and crime are fundamentally limited by problems inherent in the theoretical perspectives within which they are embedded. The task of evaluating the range of criminological perspectives and their underlying assumptions has been done elsewhere (e.g., Tittle, 1995; Wikström, 2006, 2017).[4] In short, most perspectives result in probabilistic theories of propensity that predict criminality or criminogeneity from particular conditions and cannot explain why particular people behave in a particular way in particular settings, because they lack an action mechanism (Wikström, 2006).[5] This means firstly that many studies assess the contribution of parental monitoring variables to the *prediction* of crime outcomes (e.g., in terms of explained variance), but do not explore the role of parental monitoring in the *explanation* of acts of crime. Any implied or explicitly proposed mechanisms linking parental monitoring factors and crime are poorly specified, and do not distinguish between levels of explanation (e.g., between the role of parental monitoring in developmental contexts, in contexts of action, and in exposure to those contexts). Secondly,

[3] A common focus on prediction rather than explanation means that many studies appear 'atheoretical'. However, they can be classified based on the nature of mechanisms and assumptions that are apparent from implicit statements, the analytical strategy of the study, or the operationalisation of concepts used. For example; research that reports the relationship between parental supervision in childhood and offending in adulthood assumes developmental life-course processes are at work (for explicit examples, see, McCord, 1979; Robins, 1978; West & Farrington, 1973, 1977); and many control theorists operationalise parental monitoring using measures of parental supervision and surveillance to, in part, represent direct parental controls (see, e.g., Nye, 1958; Patterson, 1982; Wells & Rankin, 1988) which means that a study which states that "parental control involves the efforts by parents to supervise and monitor their children and to set and enforce rules" (Janssen et al., 2014, p. 3) or similar, conceives of monitoring within a control perspective that emphasises short term processes that influence the crime event.

[4] For example, Tittle broadly concludes that most criminological perspectives "are plausible, yet they fail as general theories" (1995, p. 1). Specifically, from the perspective of analytical criminology, these perspectives are unable to explain crime because they do not adequately define crime, do not theorise action in order to explain crime, or do not integrate individual and environmental levels of explanation (Wikström, 2006, 2017). Those that do acknowledge person-environment interaction do not specify the process by which this interaction results in action (for discussion, see, Wikström, Ceccato, Hardie, & Treiber, 2010; Wikström, Oberwittler, et al., 2012). SAT is arguably the only comprehensive criminological theory of action. The rational choice perspective does theorise action, but is predicated on a flawed conception of the nature of human action and decision-making (Treiber, 2017a; Wikström & Treiber, 2016a). For further discussion of theoretical approaches see chapters 1 and 2.

[5] In this sense, they do not explain the expression of propensity, which happens when individuals interact with their environment.

much parental monitoring research is fragmented into taking either a psychological developmental approach to predicting individual propensity (criminality) from features of parental behaviour; or an environmental or sociological approach to predicting the environmental propensity (criminogeneity) of behavioural contexts (e.g., opportunity, deterrence) based on, for example, the presence of a parent or other guardian.

Unlike much of the existing literature on parental monitoring and crime, this thesis aims to take an integrated approach to understanding the role of parental knowledge and the presence of guardians in explaining acts of crime (criminal behaviour).

5.1.1: Bringing order

> *"Typically, mechanisms are unobservable, and therefore their description is bound to contain concepts that do not occur in empirical data"*
>
> (Bunge, 2004, p. 200)

Across the literature, proposed mechanisms linking parental monitoring and crime either emphasise the propensity (criminality) of the person (section 5.2.1.3:), or the propensity (criminogeneity) of the context of the action (section 5.3.1.1:). Some also highlight the importance of exposure and the selection of people into environments (section 5.2.2.3:). This fragmentation in theorising and subsequent study of the link between parental monitoring and crime mirrors the general fragmentation of criminological theorising. A few models or studies relevant to the study of parental monitoring and crime have attempted to combine these approaches (section 5.3.2.1:); however, these conceptions do not adequately specify how the mechanisms inherent in these approaches integrate. These weaknesses are also indicative of general flaws in the main theoretical approaches in criminology.

Chapter 2 outlined the key concepts and models of SAT and describes how the theory addresses the main problems of criminological theorising and thus provides a clear framework for understanding action (including acts of crime). The situational and social models of SAT provide a clear framework comprising the process of perception and choice, and processes of selection and emergence (see chapter 2). Application of SAT allows research to overcome the general shortcomings in criminological theory and make a contribution to the specification of mechanisms that link parental monitoring and crime. Whilst the literature provides some relevant concepts and evidence, there is a complex, disjointed and piecemeal muddle of theories and mechanisms about the relationship between parental monitoring and crime. This hinders accurate and specific knowledge, effective research, and exposition of coherent policy implications. By beginning to integrate existing parental monitoring research into the SAT

framework in this chapter, this thesis starts to organise and reinterpret existing research. Far from rejecting all previous research and evidence, the particular utility of concepts and evidence in the literature is realised within the theoretical framework of SAT because it integrates these mechanisms at different levels of explanation and provides opportunity for specification of processes within a theory of action. Such a project begins to lay the groundwork for the development of a comprehensive integrated theory of the mechanisms that link parental monitoring with crime. This task is begun with regards situational mechanisms in the following chapter.

One difficulty with assessing mechanisms in the parental monitoring literature is that this broad body of research struggles to remain coherent about what it attempts to explain because parental monitoring itself is poorly defined and operationalised. This means that theories are often referring to entirely different factors (and therefore mechanisms) than other theories when they implicitly imply or attempt to explain the link between them and crime. Not only does poor conceptualisation of parental monitoring result in a large number of ideas about its effects on crime, it serves to hinder the development and specification of these ideas. Theories and empirical research often conflate specific factors (which may be linked to crime via differing processes) within single concepts and measures of parental monitoring. This means that theories often struggle to provide testable implications of the mechanisms that link the concept and adolescent crime, and empirical studies are unable to make specific and useful conclusions based on results. The implications of the poor conceptualisation of parental monitoring for research are further discussed in chapter 4.

When looking for evidence of processes in the literature, it is first important to distinguish mechanisms from mediating variables (see further, section 1.2.1.2:). Mediating variables are not mechanisms because mechanisms involve a theoretical explanation of the link between cause and effect; mechanisms are therefore plausible (but often unobservable) processes that link variables (including mediating variables) and outcomes (Bunge, 2001, 2004; Hedström & Ylikoski, 2010; Mahoney, 2001; VanderWeele, 2009; Wikström, 2017). Mediating variables can, however, provide evidence of a proposed mechanism (Wikström, 2017). Some studies of parental monitoring do not provide any (or any adequately specified) mechanisms by which the variables under study are linked, however, their findings regarding mediating variables can potentially be applied within a theoretical framework to evidence particular specific mechanisms of interest. Using existing research findings in this way is not without problem, however. These studies are not designed to specifically test the particular mechanism of interest, and therefore their findings

may not provide complete or adequate evidence for (or against) its existence. This means that despite a large literature on the link between parental monitoring and crime, only a small number of studies provide useful evidence for or against the existence and nature of particular processes. This chapter aims to assess the existing literature on parental monitoring and crime for insights and evidence that will help contextualise and develop the detail of the proposed mechanisms that link the presence of guardians and crime and parental knowledge of the circumstances of activities and crime; or indeed, falsify or challenge them.

5.1.1.1: The basis of action

> *"For more than three decades, control theory has had a continuing influence on criminological thinking. Theories that place family processes at their core have been particularly likely to emphasise the role of various forms of control in crime and delinquency causation"*
>
> (Wright & Cullen, 2001, p. 695)

Controls, constraints and deterrents of various kinds are the most commonly implied or discussed mechanisms in the parental monitoring and crime literature, particularly with reference to the short term processes that influence action which are the focus of this thesis. These conceptions stem mostly from the control and opportunity[6] perspectives. These perspectives fall foul of the problems associated with general criminological theorising outlined in chapter 2; in particular, these perspectives are founded on problematic fundamental assumptions about the nature of human action.

The classical school of thought assumes that human action is self-interested, and therefore that behaviour is governed by its consequences. These consequences are perceived and valued by individuals differently. This conception of the process that leads to action focuses on decision-making (choice). Control theories adopt this view of human action. Crime is an easier and quicker way to achieve goals than 'conventional' behaviour and therefore motivation for crime is assumed - "deviancy is taken for granted; conformity must be explained" (Hirschi, 1969, p. 10). Only restraints (controls) are of interest in explaining the choice to conform and therefore the primary cause of crime is a lack of controls on behaviour (e.g., Gottfredson & Hirschi, 1990; Hechter, 1987; Hirschi, 1969; Nye, 1958; Reckless, 1940; Reiss, 1951).[7] Opportunity theories of crime such as rational choice theory (Clarke & Cornish, 1985), the routine activity approach (Cohen & Felson, 1979), crime pattern theory (Brantingham & Brantingham, 1993) and dynamic multicontextual criminal opportunity theory (Wilcox et al., 2003) also assume that human action

[6] Rational choice perspective in particular.

[7] For contrasting overviews and discussion of control theories in criminology, see, Agnew (2003); Britt and Gottfredson (2003); Britt and Rocque (2016); Geis (2008); Goode (2008); Laub (2011); Taylor (2001); Tittle (1995); Treiber (Forthcoming); Wikström (2008); Wikström and Treiber (2009b).

is self-interested. Actors aim to maximise pleasure and minimise pain. The decision to commit an act of crime results from a cognitive calculation which determines that the benefits of an act of crime outweigh the costs. Opportunity and controls are therefore fundamental to this choice, which is rational in the sense that it is self-interested. Efforts have been made to integrate control and opportunity theories of crime (e.g., Felson, 1986; Wilcox et al., 2003). Such a project is conceivably possible because of a shared assumption of self interested human behaviour. For both opportunity and control perspectives, controls are crucial to the decision-making process that results in a particular action.

The assumption that behaviour is governed by its consequences has particular relevance for understanding of the role of parents and parental monitoring in crime. This is because it presumes that for effective social control an agency (such as a parent) must monitor and sanction behaviour (e.g., Hechter, 1987; Hirschi & Gottfredson, 2006). The importance of controls is emphasised. When applied to the study of adolescent crime, control theory and the rational choice perspective therefore understand the role of parents as key informal providers of adequate controls,[8] and see parental monitoring and related factors as a crucial part of an effective controls process.[9]

Control theory states that parents are a key source of informal social control (Hirschi, 1969; Rankin & Wells, 2006), at least at certain points in the life course (Sampson & Laub, 1993; Thornberry, 1987). For example, Nye states that "the family is considered to be the single factor most important in exercising social control over adolescents" (1958, p. 8); and Reckless' containment theory states that parental supervision and discipline are a crucial part of the structural buffer in a person's immediate social world that is "able to hold him within bounds" (Reckless, 1961, p. 45). Control theorists identify the family as a source of both direct and indirect controls. Direct control aims to inhibit unwanted behaviour through the coercive use of rewards and punishments (instrumental control), as represented for example by direct supervision by parents (e.g., Patterson, 1982; Wells & Rankin, 1988). Indirect relational controls aim to elicit conformity via ties to 'conventional social order' which are represented by strong emotional attachment and parent child bonds (e.g., Hagan, 1989; Hirschi, 1969; Thornberry, 1987).

[8] Informal social controls are those executed by informal institutions and agents such as the family and parents, as opposed to formal institutions such as the criminal justice system.

[9] The work of Hechter (1987) also has particular relevance to the study of parental knowledge because his group solidarity theory states that control requires detection, which requires knowledge, which requires monitoring. Hechter states that monitoring capacity depends on the degree to which the monitor holds information (i.e., knowledge) about compliance with rules.

Specifically, social control theorists argue that external social environments influence action via i) processes of deterrence and ii) the reinforcement of internal controls (e.g., Reiss, 1951). This highlights that control theorists study sources of control(s) that are internal (self control) or external (social control). A major problem for the control perspective is that the relations between direct and indirect controls, and internal and external controls are unclear and problematic. Direct controls are poorly defined and operationalised (see also chapter 4), the processes by which they are effective are unclear (Rankin & Wells, 2006) and they are not always delineated as internal or external. The processes by which indirect controls relate external to internal controls are poorly specified and are a source of tension and uncertainty within the control theory paradigm (see section 5.3.2.1:).

The control perspective implies a potential role for parental monitoring in both the crime proneness of individuals (criminality, see section 5.2.1.3:) and of environments and contexts (criminogeneity 5.3.1.1:). The opportunity paradigm (routine activities perspective in particular), draws on control mechanisms to emphasise the absence of parents in settings (criminogeneity 5.3.1.1:) and parental control over exposure to criminogenic environments (selection and exposure, section 5.2.2.3:) in processes leading to crime. As discussed in the relevant sections, however; the perspectives do not adequately specify these processes.

One fundamental problem with these approaches is the assumption of self-interested behaviour. This assumption leads the control and opportunity perspectives to over-emphasise the importance of choice, whilst neglecting the importance of perception in the process that leads to action. This results in the assumption of motivation as ubiquitous and controls as pre-eminent and commonly in the conflation of rules and controls. Reiss stated that social control is "the ability of social groups or institutions to make norms or rules effective" (Reiss, 1951, p. 196). This illustrates the fundamental importance of controls in influencing self-interested behaviour for control theory, while any potential efficacy of rules in guiding behaviour is ignored. This is in stark contrast to SAT, which argues that motivations are situational and that human nature is not compelled by self-interest alone (Treiber, Forthcoming; Wikström, 2005, 2006). For SAT, human action is rule-guided (see section 2.2:), which crucially means that controls are only conditionally relevant (Hirtenlehner & Hardie, 2016; Wikström, Oberwittler, et al., 2012; Wikström & Treiber, 2007; Wikström et al., 2011; see further, section 6.2.3). Wikström and Treiber argue that:

> *"Presuming that all individuals will be equally motivated to commit a certain act in all settings provides a false simplification of behaviour that undermines the explanation of what causes individuals to commit acts of crime"*
>
> (Wikström & Treiber, 2009b, p. 393).

Neglecting the role of perception in the action process ultimately leads to the conflation of rules and controls. Rules are supportive of particular behavioural paths that individuals can or may want to follow and thus guide behaviour from the onset of the action process, whereas controls restrain behaviour at some point or various points during the action process. This distinction is crucial to SAT (see further, chapter 2 and 6) but is often overlooked by others in the control and opportunity traditions. Self control theorists conflate personal moral rules with internal control (see section 5.2.1.3:), and social control theories ignore the importance of moral rules. Social control theory makes the strong but flawed assumption that individuals and society in general agree about what is (and is not) conventional behaviour: "The control theory assumes the existence of a common value system within the society or group whose norms are being violated" (Hirschi, 1969, p. 23). As Morris et al. observe, "a weakness of Hirschi's (1969) original social bonding theory was its failure to consider not only the presence but also the content of social bonds" (Morris, Gerber, & Menard, 2011, p. 596). The opportunity perspective conceives of morality more in terms of the impact it may have on consideration of the consequences of behaviour (e.g., shame, guilt) than of rule guidance, for example, rule-setting provides cues about the permissibility of particular behaviours. This means that for opportunity theories the impact of personal or contextual rules and attitudes is on the deliberative process that results in action, and not on rule guidance. Morality plays only a small role in opportunity focused explanations of crime and it is of little interest to this paradigm (Wikström & Treiber, 2016a).

In summary, implicit or explicit control mechanisms dominate the literature on the role of parental monitoring in adolescent crime. These mechanisms are mostly rooted in the control and opportunity theoretical paradigms. Control and opportunity theories broadly draw welcome attention back to the crime event and therefore action, which means that studies and theories broadly classified within these perspectives also (implicitly) do so.[10] However, they still fail to explain crime because they do not fully specify an action process. SAT states that human action is rule-guided. The assumption of rule-guided action allows SAT to specify differential motivation, the importance of moral rules in contexts, the conditional relevance of controls and habitual action in the theory; by contrast, control and opportunity theories cannot. Despite this critique, some specific elements of control mechanisms are very relevant to the study of parental monitoring. Since SAT specifically distinguishes moral rules from controls in an integrated theory of acts of crime and solves many of the problems of contemporary criminological

[10] For example, the crucial element of Briar and Piliavin's influential definition of 'situations' states that they are of short duration, are perceived as a 'describable event' by those taking part, they constrain behaviour and have unique consequences (Briar & Piliavin, 1965). This definition implicitly distinguishes contexts of action from the longer term influence of contexts of development.

theorising described above, the particular concepts that are of use and interest in the literature are discussed where relevant in sections 5.2: and 5.3: within the integrated framework of SAT.

5.1.1.2: Social and situational dynamics: Organising the literature by process

Chapter 4 introduced a new model of goal-directed parental action, with the expressed aim of clarifying the concepts of parental monitoring, parental supervision, parental presence, presence of guardians and parental knowledge, and their conceptual interrelations. This model is therefore depicted in simple form for this purpose, however, in reality, the parenting process depicted can take place simultaneously over a period of years and decades or minutes and seconds, can occur within a single setting or across many; and also may be influenced indirectly and directly by many proximal and distal factors (for examples, see section 4.2.3.2:). This distinction between long and short term features and effects of parenting is implicit in the conclusions of ancient thinkers, modern academics, and the general public (see section 3.2: for discussion). Because the presence of guardians and parental knowledge can play a role in both the processes of long term development and change, and short term situational dynamics; it is possible to understand and study parental monitoring (and specifically, the role(s) of parental knowledge and the presence of guardians) as part of both SAT's social and situational models. The remainder of this chapter is structured around these models. This thesis focuses on the immediate and primarily short term (situational) impact of particular parental monitoring related factors on the moral context (moral rules and their enforcement) and the perception-choice process (section 5.3:). However, parents can play a large role in processes of selection and emergence that are inherent in the social model of SAT (section 5.2:).

5.2: Parental monitoring literature and the social model of SAT

SAT's social model of crime causation details the mechanisms by which broader social conditions and individual development influence the crime event indirectly via processes of selection and change.[11] Specifically, SAT's sub-model of change (section 2.4: and Figure 1 on page 65) states that processes of personal and social emergence determine the crime propensity of a person and the area social conditions of a setting respectively. The sub-model of selection states that personal and social selection processes interact to introduce particular individuals to

[11] The principles of SAT's development ecological action (DEA) model of individual stability and change in crime involvement were originally presented a decade ago (Wikström, 2005) and the model has recently been further developed and empirically tested (Wikström & Treiber, 2018, in press; Wikström, Treiber, et al., Forthcoming). This model of change focuses on individuals and their dynamic interaction with environments, therefore cutting across the sub-models of change and selection by focussing on the development, stability and change of both individual crime propensity and exposure to criminogenic settings. The DEA model therefore invokes the psychosocial process of personal emergence and the socio-ecological processes of both social and self selection.

particular settings, thus creating particular situations (person-environment interactions). These causes of the causes of crime are more distal (in terms of causal chains), and therefore exert influence via the more proximal causes of crime. Although the causes of crime are situational, the causes of the causes of crime involve often much longer term processes of development, change, selection and emergence.

Many parenting behaviours (or their lack) may have some kind of impact on crime (and desistance from or avoidance of crime) as causes of the causes. There is a potentially large role for features of parental monitoring in SAT's social model of development and change, particularly in the processes of personal emergence (section 5.2.1.2:), and social and self selection (section 5.2.2:). Although the focus of this thesis is on the role of parental monitoring in situational processes, this section applies the social model of Situational Action Theory to the study of parental monitoring, parental supervision and parental knowledge (as they are defined in chapter 4) and crime. The main reason for this is that it helps to situate much existing literature on parental monitoring and crime within the SAT framework, in order to clarify which existing research is not directly relevant to the study of situational processes.

5.2.1: Emergence

> *"The concept of emergence essentially refers to how something becomes as it is"*
>
> (Wikström, Oberwittler, et al., 2012, p. 31)

> *"What kinds of people and what kinds of settings are present in a jurisdiction is the result of historical processes of personal and social emergence."*
>
> (Wikström & Treiber, 2016b, p. 4)

5.2.1.1: Social emergence

> *"Social emergence is a 'kinds of settings' question, and a natural criminological focus is how environments (in a particular jurisdiction) become different in features relevant to their criminogeneity"*
>
> (Wikström, Oberwittler, et al., 2012, p. 32)

SAT states that "settings are *criminogenic* to the extent that their perceived moral norms and enforcement encourage (or do not discourage) acts of crime in response to the opportunities they present and/or the frictions they create." (Wikström & Treiber, 2018, in press). According to SAT's sub-model model of change, this moral context (moral norms and their enforcement) of settings is determined by historic processes of social emergence. Settings vary (over time and space) in their criminogeneity because these socio-ecological processes result in temporally and spatially varying distributions of differentiated activity patterns and the presence of particular kinds of people.

The important distinction between the supervision of people, and supervision of or in places, is of particular relevance to the topic of emergence in the study of supervision and the presence of guardians. Processes of social emergence are responsible for place-based patterns of supervision (or supervision of children whenever they are in particular places), for example, parental supervision often happens at home, and supervision by a teacher almost always happens at school. In contrast, selection processes are responsible for patterns of supervision of a particular child (see section 5.2.2:).[12]

Parents don't play a large direct role in place-based patterns of supervision; though as residents and citizens, parents may be involved in social interactions that directly and indirectly result in changes to the social characteristics of the neighbourhood (e.g., levels of collective efficacy or disorder, patterns of residential segregation and differential land use). However, parenthood is not a prerequisite for involvement in these processes. Although parents may be particularly motivated to be involved if they have a child living or attending school in a neighbourhood, it is largely in their role as residents or citizens that parents are involved in or have impact on processes of social emergence.

The process of social emergence and the related literature will not be addressed further here due to the small and indirect role of parents and particularly features of parental monitoring in this process, particularly in comparison to the prominent role of parents in and large related literature about the process of personal emergence.

5.2.1.2: Personal emergence

> *"People acquire their crime propensities in the main through psychosocial processes of moral education and cognitive nurturing"*
>
> (Wikström & Treiber, 2018, in press)

SAT states that the process of personal emergence explains how people come to be crime-prone; i.e., develop a high crime propensity.[13] According to SAT, crime propensity is the individual level component of the individual-environment interaction process that leads to acts of crime (or

[12] Whilst more research is needed into the antecedents of parental knowledge of the circumstances of activity (section 4.3:), it seems plausible that this distinction also applies to parental knowledge.

[13] SAT details how individual change has a much stronger ecological dimension than is traditionally acknowledged (Wikström, 2005; Wikström & Treiber, 2018, in press; Wikström, Treiber, et al., Forthcoming). Changes in individual offending patterns are the result of changes in contexts of action, which are the intersection of an individual with a setting (situation). The individual's response to their environment is crucial in this situational process and is therefore the key to the link between individual development (change) and changes in an individual's actions; sources of change are therefore rooted in either changes in how individuals react to settings, or changes in the settings to which an individual reacts (Wikström, 2005). The importance of context for development is also captured by Bronfenbrenner's definition of individual development as "a lasting change in the way a person perceives and deals with the environment" (1979, p. 3); however, contexts are generally neglected in developmental theory and research.

other actions). Crime-prone individuals are characterised by a weak law-relevant morality and a poor ability to exercise self control. As introduced in section 3.2:, parents are usually the prime agents of socialisation processes that include learning (e.g., moral education) and nurturing (e.g., of cognitive capacity). Therefore, parental monitoring related factors can influence acts of crime indirectly via processes of personal change and development in morality and cognitive abilities.

The role of parental knowledge in change and development of crime propensity (i.e., in the social model of SAT) has received some empirical attention. These studies do not preclude a situational role for parental monitoring related factors. Pauwels and Svensson (2010) found that poor parental knowledge of the circumstances of activity (and also insecure attachment) is related to weak morality and poor self-control;[14] and furthermore Wikström, Treiber, et al. (Forthcoming) found that changes in family and parenting factors (including parental knowledge[15]) predicted changes in crime propensity.[16] While family closeness was only marginally predictive of the development of crime propensity (Wikström, Treiber, et al., Forthcoming), other research shows that child disclosure of the circumstances of activities, which stems from a warm supportive communicative relationship with parents, is at the root of parental knowledge (Fletcher et al., 2004; Kerr & Stattin, 2000; Soenens et al., 2006; Stattin & Kerr, 2000). Taken together, these findings suggest that research should be undertaken to ascertain if family relationships can exercise influence on the development of crime propensity through their impact on factors such as parental knowledge. However, in order to be clear about the mechanism by which parental monitoring factors play a role in processes of change and development, these factors must be clearly and correctly specified and operationalised. These studies do not adequately distinguish between different kinds of parental monitoring behaviours and different measures of parental knowledge (for a discussion, see chapter 4 and specifically section 4.3.3.1:).

SAT's developmental ecological action (DEA) model of individual stability and change in crime involvement distinguishes machinery from content in processes of moral education and cognitive nurturing (Wikström & Treiber, 2018, in press). This distinction provides further framework with which to develop specific theory as to how the indirect influence of parental monitoring occurs. The prevention of illness or injury and the identification and attenuation of impeded biological development; and more proximally the maximisation of pro-social moral

[14] A similar study found similar results for active parental monitoring (Svensson, Pauwels, Weerman, & Bruinsma, 2016).
[15] Also including parents' provision of good nutrition and organised cognitive-nurturing activities.
[16] Relating to another aspect of parental monitoring (not specific to parental knowledge or presence of guardians), Svensson et al. (2016) found that within individual changes in parental efforts to keep track of their children (e.g., permission requirements and limit setting) were related to changes in moral emotions (anticipated shame and anticipated guilt) and moral values.

content of and cognitive nurturing opportunities in adolescent activity fields may all be important ways in which parents (through presence and knowledge) can impact upon the developing crime propensity of their child. This is ultimately due to the impact their presence and/or knowledge may have on the perceived moral rules and their enforcement of the developmental contexts of the child (and more indirectly, on the efficacy with which those contexts can influence development). Due to the focus of this thesis on situational processes, the specific mechanisms of this influence will not be further developed here. Future theorising of these mechanisms will likely involve integrating the role of the presence of guardians and parental knowledge in the developmental moral context[17] with SAT's developmental processes (summarised here), combined with some insights from traditional developmental literature on learning and cognitive nurturing.

[17] Detailed in chapter 6 with reference to action contexts only.

5.2.1.3: Existing literature: predicting criminality

> *"In order to advance knowledge about causal effects of family factors on offending, new prospective longitudinal studies are needed"*
>
> (Farrington, 2011, p. 148)

When applied to parental monitoring, propensity 'theories' generally state or imply that supervision, parental efforts to track their child's whereabouts, good parental knowledge, and related features of parental monitoring predict lower or reduced rates of crime. A lower rate of crime is assumed to be directly equivalent to a lower proneness to crime (propensity). This assumption of the equivalence of propensity and action ignores the influence of social context on action and emphasises only criminogenic features of individuals (criminality) as direct causes of crime. Such an approach also neglects the mechanism by which crime propensity translates into an act of crime (i.e., an action process).

Eleanor and Sheldon Glueck were conducting their research in the 1950s at a time when influential social control theorists were continuing to emphasise direct processes by which parental monitoring in settings deterred crime (see section 5.3.1.1:). They took a different approach. "We know that unsuitable supervision of boys… is far more usual in the background of delinquents than of nondelinquents. Is this a direct influence on delinquency, or does it operate, in part at least, through the development in a child of certain traits which are, in turn, more characteristic of delinquents than of nondelinquents?" (Glueck & Glueck, 1962, pp. 132-133). Although they did not rule out an effect of direct processes on offending, they did not address how such direct and indirect processes may coexist and their studies focus almost entirely on the development of criminal propensity. Their approach and seminal findings were of major importance to a new wave of psychological approaches to understanding crime.

Three further classic studies often cited as evidence for a link between parental supervision and crime are the Cambridge-Somerville study (McCord, 1979), the St Louis study (Robins, 1978) and the Cambridge Study in Delinquent Development (West & Farrington, 1973, 1977). All three studies are examples of predominantly psychological studies that show that a measure of (poor) parental supervision in childhood strongly predicts offending in adulthood, decades later. This longitudinal approach to analysis of the effects of parental supervision results from an assumption that the processes by which parental monitoring influences offending outcomes are related to individual differences and the development of individual crime propensity. Very rarely do such studies explicitly specify the processes by which parents influence their children's actions

(and if an attempt is made to explicate causes, these are "hotly debated" (Shelton et al., 1996, p. 317).

In recent years, an increasing number of studies investigate complex developmental relationships between parental monitoring relevant variables (e.g., parental knowledge or child disclosure in addition to supervision) and a range of negative outcomes such as crime, anti-social behaviour and substance use (e.g., Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003; DiClemente et al., 2001; Eamon & Mulder, 2005; Kerr et al., 2010; Ramirez et al., 2004; Richards, Miller, O'Donnell, Wasserman, & Colder, 2004; Siebenbruner, Englund, Egeland, & Hudson, 2006; Webb, Bray, Getz, & Adams, 2002). These broadly psychological studies of individual propensity represent some methodological progress from the classic propensity studies of the 1970's because they use longitudinal data and complex statistical models to test developmental relationships. However, they still do not attempt to capture the environments within which individuals act nor situational processes, and most problematically, lack explicit or implicit acknowledgement that these factors and processes may be crucial. This is symptomatic of a generally myopic approach that fails to integrate different levels of explanation.

By taking a predominantly psychological approach, such recent and classic research not only ignores the influence of social context in the acquisition of crime propensity, but particularly that individuals express this propensity differently in different contexts (see further, Wikström & Treiber, 2018, in press). As SAT highlights, social contexts are both contexts of development (when propensities are acquired), and contexts of action (when propensities are expressed). Similarly, prominent generally developmental theories of crime such as Gottfredson and Hirschi's self control theory (1990); Moffitt's dual developmental taxonomy (1993); and Laub and Sampson's age-graded theory of informal social control (2003) do not take into account the interaction of individuals with social contexts (see further, Wikström & Treiber, 2009b; Wikström & Treiber, 2018, in press).

For developmental theories of crime, the role of parental monitoring lies in its relationship to long-term processes of the acquisition (and change and stability) of propensity, but the mechanisms of this relationship are poorly specified and neglect the role of social context (of both development and action). Conceptions of crime propensity vary depending on how the approach conceives of human nature. Crime propensity can refer to internalised criminogenic attitudes which are learned (e.g., Burgess & Akers, 1966; Sutherland, 1947), via processes of instruction, observation and reinforcement (for detail on these learning mechanisms see, Akers,

1973, 1998; Bandura, 1963; Scott, 1971). While the implication that parental presence and discipline afforded by supervision facilitates increased modelling, instruction and reinforcement of pro-social values; specifically how parental monitoring influences these learning processes is not clear.

By contrast, control theories argue or assume that social learning is a mechanism by which external controls can become internalised; this learning and these controls are both made effective through processes rooted in parental attachment,[18] and it is these controls that are crucial for inhibiting actions (such as crime) (Gottfredson & Hirschi, 1990; Hirschi, 1969; Nye, 1958; Patterson, 1982; Rankin & Kern, 1994; Rankin & Wells, 2006; Reiss, 1951). For example, Gottfredson and Hirschi's (1990) self control theory is a theory of individual crime propensity. Self control is internal to the person. The initial statement of self control theory defined it as the stable tendency of an individual to pursue immediate gratification to the neglect of its long-term negative consequences (ibid, 1990); though there are different conceptions of what it encompasses and how it functions (e.g., Gottfredson, 2011; Hirschi, 2004; Hirschi & Gottfredson, 2006).[19] Control theory considers crime to provide a large reward for little effort with maybe delayed negative outcomes. Those less likely to consider the consequences of their actions are more likely to be susceptible to such a temptation. Self control is mostly presented as a stable trait that is essentially immune to situational inducements (Gottfredson & Hirschi, 1990). Gottfredson and Hirschi (1990) are unequivocal about the origins of self control in early childhood, stating that effective parenting is crucial. Direct parental controls such as supervision and discipline allow children to learn self control via reinforcement and the monitoring and censure of uncontrolled behaviour. Therefore, for self control theory, a lack of self control in offenders is the result of poor child-rearing (ineffective parenting) (Gottfredson & Hirschi, 1990).[20]

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[18] Attachment to parents is of particular relevance for some control focused theories of crime (Hirschi, 1969; McCord & McCord, 1959; Nye, 1958), as "the emotional bond between the parent and the child presumably provides the bridge across which pass parental ideals and expectations" (social control theory, Hirschi, 1969, p. 86).

[19] The concept of self-control is imprecise and over-inclusive and has at various times implicitly and explicitly included social bonds, morality, agency, cognition, and rational choice (e.g., Gottfredson, 2011; Gottfredson & Hirschi, 1990; Hirschi, 2004; Hirschi & Gottfredson, 2006). This has also made it difficult to measure empirically (Piquero, 2008). The imprecise and contested definition of self control also means that it has implications for other mechanisms that link parental monitoring and crime and therefore features in discussions in other sections of this chapter.

[20] In this sense, for self-control theory, self-control mediates the effect of parenting on crime. Gottfredson and Hirschi (1990) argue that ineffective parenting is a distal cause of criminal behaviour because the effect of parenting on crime operates solely through self control. Empirical evidence suggests that the effect of parenting on crime is indeed at least to some extent mediated by self control (e.g., Burt, Simons, & Simons, 2006). SAT also sees parental monitoring as a cause of a cause of crime. Proponents of SAT would also expect a model designed to test self control theory to show that self control mediates the relationship between parenting and crime. However, they

For self-control theory, the kinds of parenting factors that are crucial to the development of self control are monitoring/tracking and recognising deviant behaviour (i.e., parental presence and knowledge), and consistent punishment (deterrence). Since Gottfredson and Hirschi (1990) argue that self-control is a fixed trait that is manifest at around age 8-10, this implies that parental efficacy after this point plays no role in explaining criminal behaviour. Self-control theory ignores any possibility of a situational, contextual effect of parenting on behaviour, and, like other control approaches, conflates rules with controls and cannot account for any conditional relevance of controls.

Problematically, control theorists conflate personal (internalised) rules with internalised controls (self-control) (see section 5.1.1.1:). For example, Reckless stated that "another identifiable component of inner containment consists of retention of, adherence to, commitment to, acceptance of, identification with, legitimation of, defense of values, norms, laws, codes, institutions, and customs" (Reckless, 1950, p. 476); moral rules are increasingly subsumed in conceptions of self-control (e.g., Gottfredson, 2011; Hirschi, 2004; Hirschi & Gottfredson, 2006); Britt and Rocque (2016) incorrectly argue that SAT's concept of morality is actually an internal control; and Nye states that "rules continually control and deprive individuals of desired activities or objects" (1958, p. 83). This means that control theories neglect the potentially crucial role of parents in the development of personal morality, independent of self-control, and the effect of these moral rules (in interaction with those of the moral context) on action. In this way, SAT's conception of individual crime propensity differs crucially to that of the control perspective.[21]

Finally, of particular relevance for the study of parental knowledge is another group of studies within the parental monitoring literature that are broadly developmental in approach. These studies focus on parental knowledge and what it represents. The present study takes an analytical approach to explaining the role of parental knowledge in crime by describing and testing mechanisms by which it influences action. In contrast, this group of studies attempt to

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would not expect self control to fully mediate this relationship, as Gottfredson and Hirschi (1990) imply. This is because SAT requires that such a model of the role of parental monitoring and self control in crime causation specify self control differently (see, (Wikström & Treiber, 2007)), partly in order to partial out the effects of morality and self control independently, identify self control as only having a conditional effect (when morality is low), and take account of the impact of action contexts on the action outcome.

[21] In particular, the SAT conception of self control differs fundamentally to that of Gottfredson and Hirschi (see, Wikström & Treiber, 2007). For SAT, crime propensity comprises the ability to exercise self control and also personal morality; and the relevance of controls including self-control is not ubiquitous, but conditional on situational conflict between the moral rules of the setting and the actor's own moral rules. In addition, the SAT approach would also suggest that it is unspecific, incomplete and (in the case of unconventional parents) erroneous to use strong parental bonds as a proxy for low crime propensity (and weak parental bonds as a proxy for high crime propensity), as advocated by social bonding theory (Hirschi, 1969), because bonds do not specify moral content.

understand the meaning of parental knowledge by instead researching its sources (Crouter et al., 2005; Kerr & Stattin, 2000, 2003; Stattin & Kerr, 2000; Waizenhofer et al., 2004). For example, Crouter et al. (2005) state that "unravelling the meaning of parental knowledge requires focusing on how parents learn about their children's daily lives" (p. 869). Crouter et al. (2005) do not address at all *how* parental knowledge plays a role in adolescent action. Crouter et al. (2005) report that "parental knowledge is a potential mechanism that links parents' strategies for acquiring information to their adolescents' subsequent levels of participation in risky behaviour" (p. 870). This is problematic because in their model, parental knowledge is actually a mediating variable; they provide no description or evidence of a process that links the sources of knowledge to behavioural outcomes (mechanism). However, the nature of the mechanism they implicitly assume is at work is implied from their methodology and analytical approach. Their measures of sources of parental knowledge and levels of parental knowledge predict adolescent behavioural outcomes one year later. This entails a developmental approach, as opposed to one concerned with short term perhaps even momentary processes.

5.2.1.4: Summary

The developmentally-focused literature on parental monitoring replicate a clear and robust correlation with crime, and evidence the relevance of some variables that mediate this relationship; however, no studies develop a full and adequate account of the process(es) by which parental monitoring may prevent crime (or by which a lack of parental monitoring may cause crime). Although many of these studies collect good quality data and employ some complex methodological and statistical techniques, this body of research is still far from full theoretical specification of the mechanisms at work in these processes. For example, social learning is presented as a major mechanism by which individuals develop particular crime propensities, and parental monitoring factors such as supervision are posited as factors that are positive for socialisation (including the development of self control). However, the details of the mechanism by which parental supervision plays a role in this process and how individual crime propensity translates to acts of crime are sparse.

Farrington (2011) states that developmental theories need further testing; however, further testing of social learning or attachment theories of the link between specific family factors and crime will not result in better explanation of the causal processes because they do not fully explicate the mechanisms by which the risk factors and mediators with which they are concerned

are relevant and plausibly influence the crime outcome. They anyway do not take account of social context.[22] They are only theories of crime propensity and not theories of acts of crime.

In addition, studies undertaken within this broad developmental approach are also not necessarily mutually exclusive to parental monitoring research rooted in alternative perspectives that focus on contexts of action (environments and settings). This means that together (but un-integrated) they further contribute to the fragmentation of knowledge about the causes of crime. The focus on long-term developmental processes continues, but despite calls for longitudinal research that imply otherwise (e.g., Farrington, 2010, 2011), not all mechanisms that link features of parental monitoring and crime involve long-term processes such as the development of criminality.

5.2.2: Selection

> *"Processes of social and self-selection place kinds of people (those with certain personal characteristics) in kinds of settings (those with certain environmental and circumstantial features), creating particular kinds of interactions."*
>
> (Wikström & Treiber, 2016b, p. 4)

Exposure of particular people (and their characteristics) to particular settings (and their characteristics) is a central concept in SAT. Settings and their characteristics as experienced by particular people represent contexts. Exposure to contexts of both development and action is what links the respectively long and short term processes of development (sub-model of change) and action (situational perception-choice process) (see Figure 1 on page 65). Exposure of kinds of people to kinds of settings gives rise to situations, to which action is a response. Selection explains why particular people are exposed to particular settings. For this reason, selection is an important 'cause of the causes' for SAT, as opposed to a source of bias. SAT therefore makes a crucial distinction between processes of selection (which determine which people take part in which settings) and processes of both change and action that determine the effect of those settings (Wikström, 2006; Wikström, Oberwittler, et al., 2012).

Specific to the kind of exposure that is relevant to the study of parental monitoring, selection processes are responsible for patterns of supervision of a child. Selection processes determine if and when a particular child is supervised. When a child is being supervised for a period of time, the supervisor is present in all settings in the child's activity field during that time. Selection

[22] Hirschi himself acknowledges this: "If the conscience is a relative constant built into the child at an early age, how do we explain the increase in delinquent activity in early adolescence and the decline in late adolescence? It is also easy to slip into mere tautology when the locus of control is placed inside the person" (Hirschi, 1969, p. 87)

processes are also responsible for a child being in a supervised place, i.e., attending school or being at home.[23, 24]

It is the interaction of processes of social selection (based on rules and resources) and self selection (based on preferences and agency) that determine exposure, and, "depending on the circumstances, social or self selection can be more influential in explaining why a particular person takes part in a particular setting" (Wikström, Oberwittler, et al., 2012, p. 38).

5.2.2.1: Social selection

SAT states that processes of social selection are the social forces that enable or restrict particular people from taking part in particular (space and time based) activities; and that these social forces are dependent on resources and rules (Wikström, Oberwittler, et al., 2012). In any jurisdiction, particular rules may be formal and/or informal, and individual and institutional resources are both differentially distributed. Parents "exercise some control over young people's access and hence exposure to different moral contexts and therefore may be able to actively minimize their exposure to criminogenic developmental and action contexts" (Wikström & Treiber, 2017, pp. 80-81)

There is existing evidence that the effect of social context and structure on offending is mediated through family processes and parenting practices (e.g., Patterson, 1996; Sampson & Laub, 1993). In addition, contextual factors may be markers for subsamples of parents "who are characteristically inept in their parenting practices" (Patterson, 1996, p. 91), for example, poorer parental education is associated with less adaptive cognitive and analytical competencies in parents (Davis-Kean, 2005; Pagani, 2009). However, the specifics of how these relationships relate to crime are not fully clear in this research, so the application of SAT's sub-model of selection can provide guidance as to how to specify these processes.

Social forces (e.g., national level economic policy; socio-cultural rules; political ideology; and global changes such as technological developments) enable or restrict parental options, choices and abilities which then influence their parenting style and family context. In this sense, together with the processes of personal emergence and self-selection relating to the parents themselves, processes of social selection shape parental decisions about and responses to these social forces, which can help explain levels of parental (or proxy) presence and parental knowledge, as experienced by the child. For example, child neglect laws and social convention regarding

[23] How particular places come to be supervised are due to processes of social emergence, see section 5.2.1.1:.
[24] Whilst more research is needed into the antecedents of parental knowledge of the circumstances of activity (section 4.3:), it seems plausible that this distinction also applies to parental knowledge.

supervision, as well as differential resources (e.g., single parent families) can influence whether a guardian is present in a particular setting. These emergence and selection processes are the 'causes of the causes'. A range of factors are implicated including religion, ethnicity, school, neighbourhood, social disadvantage, and family structure, which indirectly impact upon "the nature and frequency of available settings (in a jurisdiction) or the rules regulating and the access to resources relevant to a particular person taking part in particular settings" (Wikström & Treiber, 2018, in press). For example, these factors may influence, promote or restrict parental rules or control of resources that facilitate or restrict particular activities in particular settings (e.g., refusal of transport provision to the home of unfavoured peers; or parental limit-setting involving rules about the time, location, or nature of particular activities).

5.2.2.2: Self selection

The preference-based choices people make about taking part in particular (space and time based) activities are self selection. These choices always take place within the constraints of social selection forces. These preferences develop over time as a result of experiences. The presence of parents or other guardians, or knowing they have knowledge of the activity may alter (positively or negatively) a child's affective experience of a particular activity. This can shape activity preferences and thus influence self-selection processes. Different people have different capacities to enact their preferences and make things happen intentionally (agency) and within individuals these capacities change over time and vary by contexts (Wikström, Oberwittler, et al., 2012; Wikström & Treiber, 2018, in press). Within the constraints of social selection processes, these self-selection processes impact on the nature and frequency of criminogenic exposure through their influence on activity fields.

5.2.2.3: Existing literature: selection and exposure

Routine Activity Theory (RAT) states that people commit crime in response to opportunity, defined as the convergence of a motivated offender and suitable target in the absence of a capable guardian (Cohen & Felson, 1979). For RAT, what kind of situations (person-environment interactions) arise is dependent on the structure of routine activities (see also, Brantingham & Brantingham, 1993). In this way, RAT is "the criminological approach most relevant to the problem of (social) selection" (Wikström, Oberwittler, et al., 2012, p. 38). RAT does not specify a model of *how* the convergence of a motivated offender and suitable target in the absence of a capable guardian results in action (such as acts of crime) (Wikström, 2010a; Wikström et al., 2010). As a result, unlike SAT, RAT fails to distinguish between factors that determine which people take part in which settings and factors that determine the effect of those

settings (Wikström, 2006; Wikström, Oberwittler, et al., 2012). This limitation is reflected in studies rooted in the RAT perspective.

RAT has influenced various areas of parental monitoring research in criminology (see also section 5.3.1.1:), one of which being the understudied determinants of criminogenic exposure. Invoking mechanisms of both direct and indirect control, Janssen et al. (2014) found that "more parental monitoring, more parental limit setting and a higher quality of the parent adolescent relationship were related to less time spent in criminogenic settings" (p. 1), and furthermore that decreases in these also predicted increases in criminogenic exposure (with the exception of a reduction in parental monitoring by age, which appeared normative and didn't result in an increase in criminogenic exposure – see further section 4.3.2.2:). A second study goes on to show that the effect of such parenting changes on exposure are mediated by changes in individual characteristics (Janssen, Bruinsma, Deković, & Eichelsheim, 2016), therefore investigating both social and self selection processes. While these findings contribute to the literature on parenting and crime, they are limited. Like RAT, this study does not distinguish between parental influence on processes of selection and parental influence on contexts (of both action and behaviour). This means that conclusions relating to the mechanism by which parenting behaviours have effect on criminogenic exposure to these contexts and ultimately on adolescent behaviour are confused and vague.

The study of peer influence is another area of research that has shown some interest in the role of parents and parental monitoring in adolescent criminogenic exposure and processes of selection. Attempts have been made to integrate theories of family and peer effects, where previously they were analysed in isolation (Warr, 1993, 2002). Rather than just focussing on the role of parents or peers in contexts of action or development, this integrative work has prompted discussions of parental influence on adolescents' exposure to (particular) peers. However, this work is not integrated with a wider action theory that can explain how this exposure can influence behaviour.

5.2.3: Summary

This section has focused on SAT's social processes of emergence and selection, and the literature that aims to predict criminality or exposure; however, this thesis focuses on the situational process that explains action. The social model of SAT was addressed in this section primarily in order to situate existing research on parental monitoring and crime within the SAT framework, and separate it from literature that may be relevant to the situational processes of interest.

Despite the focus of this thesis on the role of parental monitoring in a situational explanation of crime, there are many aspects of the social model of SAT (as laid out, for example, by Wikström & Treiber, 2018, in press) that can be applied to the parental monitoring area of research. Continued application of this framework would provide a rich resource for future study of the role of parental monitoring, parental knowledge and supervision in stability and change in adolescent behaviour. There is a considerable role for parental monitoring and more specifically the presence of guardians and parental knowledge in the processes of emergence and selection; yet this thesis will not discuss these further. This is because it is the effect of propensity and exposure that is most relevant for action; rather than how and why that propensity and exposure came about (explained by processes of social emergence and social and self selection). The question of interest for this thesis is the role of parental knowledge and the presence of guardians in the situational process by which propensity and exposure interact to result in acts of crime.

5.3: Parental monitoring literature and the situational model of SAT

> *"Acts of crime are ultimately an outcome of a perception-choice process that is initiated and guided by the interaction between a person's crime propensity and criminogenic exposure"*
> (Wikström, Oberwittler, et al., 2012, p. 11)

This thesis focuses on situational processes. This section briefly summarises the situational model of SAT, and in what way existing parental monitoring literature does and doesn't align with or contribute to this model. In the context of this literature, chapter 6 goes on to develop the situational model of SAT by applying it to the study of the presence of parents (and other guardians) in settings and adolescent perception of their parents' knowledge of their activities in the perception-choice process that leads to actions such as crime. The situational model specifically states that the interaction between a person's crime propensity and his or her criminogenic exposure initiates a perception-choice process that guides action (Treiber, 2017b; Wikström, 2006, 2014, 2017; Wikström, Mann, et al., 2018, in press; Wikström & Treiber, 2016a).

SAT states that the crucial features of crime prone (high crime propensity) individuals are a weak law-relevant morality and a poor ability to exercise self control. Morality comprises moral rules

and moral emotions (shame and guilt).[25] SAT's social model explains how people come to be crime prone (develop a high crime propensity), and is briefly applied to the study of parental monitoring in section 5.2:. The discussion highlights that parents are key agents of their children's moral and cognitive development, and of influence over their activity fields and preferences. This means that there is a central role for aspects of parental monitoring in processes of personal emergence and social and self selection which ultimately influence the crime propensity of the child. This dynamic process involving change is not discussed further here because in order to test SAT's situational model, it is sufficient to capture an individual's crime propensity in the situation (or as close to the situation as possible) in order to understand the situational processes by which actors and settings interact to produce action.

Criminogenic exposure refers to a particular individual's exposure to contexts that encourage (or do not discourage) crime. How individuals come to be exposed to particular settings, and how this exposure may influence their moral and cognitive development, are also explained by elements of SAT's social model. The role of parents in these processes is discussed in section 5.2.2:. The situational model is concerned instead with the process by which individuals interact with moral contexts in the action process. This process is the perception-choice process. The presence of parents and other guardians and parental knowledge of the circumstances of activity can influence both the moral context of action and the perception choice process. The specifics of this particular parental influence on the situational model of SAT are detailed in chapter 6. The remainder of this chapter describes how concepts from the existing literature are (and are not) relevant to the development of ideas in chapter 6 about how parents and their behaviours i) can form part of and directly influence the moral context (moral rules and their enforcement) (section 5.3.1:) and ii) may influence the perception choice process itself (section 5.3.2:).

5.3.1: Contexts of action

Contexts such as planet earth, nations, cities, neighbourhoods, families, peer groups and settings are multi-level and interrelate; and cross through a range of disciplines (e.g., sociology, social-psychology, psychology). Bronfenbrenner's (1979) ecological model of human development emphasises the embeddedness of individuals who interact in micro-systems that are nested in layers of ever-larger systems. The social model of SAT captures the effects of such embeddedness. In contrast, SAT's situational model aims to explain action, and therefore examines the direct effect of contexts on behaviour. Contexts that are able to have such a direct

[25] Within the SAT framework, shame is defined as a negative feeling experienced in the presence or consideration of others; whereas guilt refers to a negative feeling felt inwardly towards oneself (Trivedi-Bateman, 2014; Wikström, Oberwittler, et al., 2012).

effect on behaviour are those whose objects, persons and events can be directly accessed by a person with their senses. For SAT, this constitutes a setting (Wikström, 2006). SAT states that the crucial feature of criminogenic settings is a weak moral context. The moral norms that apply in a particular setting and the enforcement of these norms determine the moral context of a setting. A weak moral context is therefore characterised by weak moral rules and a poor level of enforcement of those rules (e.g., deterrence).[26] Settings include the persons present in them, including parents and guardians. This means that, for SAT, by being present in action contexts parents can influence both the content of the moral rules of settings and the level of enforcement of those rules.[27]

5.3.1.1: Existing literature: predicting criminogeneity

Brantingham and Brantingham (1993) state that "the primary weakness in most criminological theory is a tendency to equate criminality with crime when criminality is but one of the elements contributing to a criminal event" (p. 260). In response to this weakness, there developed and grew a large group of theories and studies that have moved the focus of study from individual criminogeneity to criminal events (Brantingham & Brantingham, 1993).[28] Whilst this focus on action is most welcome from an SAT perspective, arguably in reality most are actually theories and studies which predict the effects of environments and settings on action. They do not truly theorise or study the mechanisms by which environments play a role in the action process (i.e., in interaction with individuals, see further sections 2.3: and 5.3.2.1:). This means that most studies of context in criminology are actually predictions of criminogeneity. Theories of criminogeneity are propensity theories because they use criminogenic features of contexts (settings and environments) to predict rates of crime. The difference between theories of criminogeneity and criminality is that the unit of study or interest is contexts and environments rather than individuals. This approach assumes that a lower rate of crime in a setting or area results from the lower crime proneness of that environment.

By focusing on the criminogeneity of environments and their circumstances, theories and studies ignore the influence of the criminality of those individuals who are actually doing those acts of crime (or not) within that environment. This neglect of features of individuals (and their

[26] SAT states that how settings come to have the criminogenic features they do is explained by processes of social emergence, and that the nature of an individual's exposure to particular settings is explained by processes of selection. SAT explicitly distinguishes these processes from the situational model.

[27] This is also the case for developmental contexts, or, the developmental effects of contexts. This is explained by the process of personal emergence (section 5.2.1.2:).

[28] Brantingham and Brantingham (1993) list and reference rational choice theory, routine activities theory, environmental criminology, strategic analysis, and lifestyle theory; and also list some expansions and research applications of these, e.g., situational crime prevention, hot spot analysis, opportunity theory.

interaction with features of the environment) distinguishes these theories and studies of criminogeneity from situational research (see also sections 5.3.2.1: and 7.3.1:). Not only do these approaches ignore (or only pay lip-service to) the role of individual differences in acts of crime, but they are theories of propensity rather than action and as such neglect the mechanism that links area or setting level criminogeneity to an act of crime.

Most theories of criminogeneity are conducted within the control or opportunity paradigms.[29] This means that they assume that human action is self-interested (section 5.1.1.1:) and that the crime-proneness of an environment depends on a lack of controls or the presence of opportunities. Most theories of criminogeneity ignore the role of rules that guide behaviour in settings, including those of the people in settings. This is in contrast to the SAT approach (see section 5.1.1.1:). When theorising the role of context in crime causation, SAT distinguishes between the rules (including moral rules) of settings and the level of enforcement of those rules in settings. For SAT, whilst enforcement of rules can be important, the rules themselves are fundamental to the process of person-environment interaction that leads to action (including crime).

Most theories and studies of the influence of parental monitoring on environmental and setting criminogeneity focus on direct supervision, such that supervision predicts lower or reduced rates of crime. For control or opportunity based theories and studies of criminogeneity, this is because the presence of parents and other guardians increases controls and deterrents in settings, and the absence of parents and other guardians reduces controls and deterrents; though the details of the mechanisms by which this occurs are usually vague.[30]

[29] While many theories of criminogeneity are ultimately control theories, not all approaches rooted in the control perspective focus on environments. For example, where control theories emphasise individual propensity (e.g., self control theory, Gottfredson and Hirschi (1990)), the processes involved are discussed with reference to SAT's social model (section 5.2.1.3:).

[30] Hirschi (1969) highlights that parents need not actually be physically present in order to influence the criminogeneity of settings, but the focus is still on mechanisms of control (psychological presence is discussed in section 5.3.2.1:)

Moral rules

> *a "measure of the strength of a moral rule that applies to a setting is the degree to which it is shared (…) by those taking part in the setting"*
>
> (Wikström, 2010a, p. 222).

SAT is the only theory of crime causation for which action is rule-guided. This means that there are no pre-existing specific hypotheses or studies of the impact of the presence of parents on the moral rule guidance of action contexts. However, there are some discussions that are relevant to the study of parental influence on their adolescents' moral contexts that arise from the literature on peer influence.

As in the parental monitoring literature, a distinction between contexts of development and contexts of action is not often explicitly acknowledged in the peer influence literature. Notably, however, Beier (2017); Haynie and Osgood (2005); Thomas and McGloin (2013); and Weerman, Wilcox, and Sullivan, have all distinguished between peer influence mechanisms that emphasise social learning processes and those that exert influence at the situational level. Even if research does not explicitly state which process is under study, it is often clear implicitly. For example, it is apparent that Warr's studies of influence on 'the everyday lives of adolescents' (Warr, 1993, 2002) are not so concerned with long-term developmental processes.

In comparison to studies of parental monitoring, studies of peer influence (both developmental and situational) are more focused on rules than controls. For example, in contrast to the control paradigm, attitudes, norms, and moral rules are fundamental to the differential association theory approach to the study of peer influence (Sutherland, 1947). The situational peer influence literature focuses on peer culture and adolescents' exposure to criminogenic aspects of this (including the peers themselves). It highlights the importance of the presence of particular people and *their* criminality in action contexts (for a discussion of research on situational peer influence, see Beier (2017)). Ultimately, however, the conception of morality and the role it plays in action differs to that of SAT. Whereas moral rules guide behaviour for SAT; for most situational peer influence studies, particular attitudes 'free' adolescents to behave in particular ways or foster bonds to others (for example, unconventional others). Situational peer influence research is often therefore undertaken within a rational choice model of action decision-making, such as studies rooted in RAT (e.g., Haynie & Osgood, 2005; Weerman, Bernasco, Bruinsma, & Pauwels, 2015). Despite these differences, this research therefore draws attention to the moral rules of people in settings. This is particularly relevant to this study when this approach is applied to parents.

Warr (2002) attempted to integrate research on peer and parental influence. He doesn't explicitly discuss the influence of parents on the moral contexts of action. In fact, although he recognises that "family and peers are commonly viewed as *competitors* in the lives of adolescents" (Warr, 2002, p. 109), his research focus is still on the conflict between parents as barriers to crime (following Hirschi's social bonding/control theory) and peers as instigators of crime (following Sutherland's differential association theory) in contexts of action. However, his conclusion that parents are "capable of counteracting one of the strongest influences on American adolescents" (Warr, 1993, p. 262) leaves room for future exploration of the role of parental influence on the moral contexts of action. In this sense, reinterpreting research on situational peer influence through the lens of SAT can highlight the role of people present in settings (and their personal moral rules) in shaping the moral rules of the setting which might help to guide behaviour. This could help research into the role of parents in action contexts to focus on the moral guidance that parents (and other guardians) bring to a setting as opposed to focusing just the enforcement and deterrent effect of their presence.

Enforcement

The focus of theories and studies of criminogeneity within the control and opportunity paradigms is the absence of controls. For these approaches, the presence of parents and other guardians in settings has implications for the level and nature of controls in behavioural contexts.

A large proportion of the literature on the effects of the presence of parents on the criminogeneity of environments assumes a direct control mechanism, albeit often implicitly. Direct control is the instrumental control of behaviours through the coercive use of rewards and punishments, and is usually negative in the sense that it aims to inhibit particular unwanted behaviour (Nye, 1958; Rankin & Wells, 2006; Wells & Rankin, 1988). Traditional deterrence theory posits that the individual is deterred from the act of crime by concern that they will be caught and sanctioned (i.e., the costs of crime will outweigh the benefits) (for a discussion, see, Wikström, 2008). These approaches focus on the direct role of constraints in the decision-making process. Research suggests that direct coercive parental controls can have deterrent effects on crime (see, Rankin & Wells, 2006). In the family context, direct controls are usually represented by i) parental rule setting (and setting expectations for consequences of non-compliance); ii) parental monitoring (which entails supervision and surveillance); and iii) parental discipline and punishment practices (see, e.g., Nye, 1958; Patterson, 1982; Wells & Rankin, 1988).

Although the presence of parents is not essential for them to exercise direct control over their children, it is often assumed to be the mechanism by which their presence results in lower rates of crime. The general problem with empirical research on the role of direct controls is that their definition is not straightforward. There are many different conceptions of factors that are relevant to direct controls. Parenting styles (e.g., 'strict' parenting), parental monitoring, punishment, supervision and parental presence may be and often are all differently conceptualised and empirically measured (Rankin & Wells, 2006). In particular, presence is necessary but not sufficient for supervision (see section 4.3.1:). This means that without first clearly defining and differentiating elements of parental rule setting, monitoring and discipline it is not possible to be clear about the mechanisms by which parentally exercised direct controls may be effective. In addition, such a focus on controls is to neglect the content of what it is that is being enforced or deterred. Whilst Hirschi (1969) assumes a shared conventional morality, this is problematic (Morris et al., 2011; Treiber, Forthcoming), and the content of morality is important for the nature of rule-guided action.

Building on control theory, Routine Activity Theory (RAT) conceives of the role of parental monitoring in crime as a key element of social control (e.g., Cohen & Felson, 1979; Felson, 1995; Osgood et al., 1996). To use Mead's (1934) terminology, a parent is a key example of a 'significant other'. Initial presentations of RAT (e.g., Cohen & Felson, 1979) renamed such significant others 'capable guardians' who were providers of social control. The routine activities perspective states that people commit crime in response to opportunity. Opportunity is defined as the convergence of a motivated offender and suitable target in the absence of a capable guardian (Cohen & Felson, 1979). The link between RAT and social control theory was further explored when Felson (1995) attempted an integration of RAT and Hirschi's (1969) social bonding theory. Felson's initial step was to move away from the original guardianship terminology of RAT because it referred to a relationship to an object (i.e., monitoring of suitable targets) which means the concept is not suitable for application to the monitoring of likely offenders. Significant others are instead defined as 'handlers' (Felson, 1986, 1995), presumably to highlight the social control role of the significant other over the potential offender.[31] Clarke (1992) describes different degrees of responsibility for the discouragement of crime, and Felson's (1995) integration of RAT and social bonding theory applies this concept to offenders such that those with differing levels of responsibility for an individual also discourage crime by that individual to differing degrees. Specifically, Felson (1995) argues that those with strong social bonds will be more easily 'handled'. This is a useful discussion insofar as it specifies that parents

[31] See Osgood et al. (1996) for discussion of the shift between the concepts of guardianship and handlers.

(i.e., those with presumably the strongest bonds to the individual) may be more effective in settings than teachers, other professionals and other guardians (see also 4.3.2.1:). However, Felson (1995) does not detail *how* this discouragement occurs, only making vague statements such as "a handler supervises the likely offender... direct physical contact serves to discourage crime from occurring" (1995, p. 54). RAT relies on the rational choice model of decision-making which means that the implicit underlying mechanism is one of deterrence, such that stronger bonds mean more weight to and therefore effect of sanctions and judgements (see also, Felson, 1986).[32]

Osgood et al. (1996) developed an influential approach that builds on RAT and is firmly committed to predicting criminogeneity. Their concept of the presence of parents and other supervisors in settings means that studies undertaken within this approach focus on the deterrent effect of the authority figure present in the setting. A large number of studies show a consistent positive association between the amount of time that adolescents spend unsupervised[33] and rule-breaking behavioural outcomes such as crime, substance abuse and anti-social behaviour (e.g., Anderson & Hughes, 2008; Kiesner, Dishion, Poulin, & Pastore, 2009; Mahoney & Stattin, 2000; Maimon & Browning, 2010; Osgood & Anderson, 2004; Osgood, Anderson, & Shaffer, 2005; Osgood et al., 1996; Riley, 1987), (see also, Hoeben, 2016 for a review). These studies are not studies of propensity like those referenced in section 5.2.1.3: because they focus on the effects of exposure to criminogenic environmental features on crime events as opposed to the development of individual criminality. However, since the analysis is undertaken at an individual rather than event level, it cannot be concerned with explaining action (see further, chapter 7). Indeed, being rooted in RAT, the approach does not have a model of action. This means that the nature of the mechanism by which the absence of guardians and supervisors (including parents) relates to acts of crime has not been fully specified. For example, Osgood et al. (1996) state vaguely that "a situation is more conducive to deviance if no authority figure is present" (p. 640). They assume a control mechanism, as is clear from the following statement: "By authority figure, we mean someone whose role in a situation carries a responsibility for attempting to exert social control in response to deviance" (p. 640); however, throughout their influential paper, Osgood et al. (1996) make no detailed specification of why or how the absence of an authority figure influences acts of crime by increasing the criminogeneity of a setting.

[32] The presence of other guardians also increases the likelihood of detection because guardians can act as informants; the less proximal the guardian, the less effective an informant they are (Felson, 1994, 1995).
[33] This unsupervised time captured by these studies is also usually unstructured and spent with peers.

RAT is founded on a rational choice model of self-interested action. In the presence of a suitable target and in the absence of a capable guardian an actor is assumed to be motivated to offend, meaning that RAT is not interested in studying individual differences in general.[34] Whilst RAT is merely disinterested interested in individual differences; the approach of Osgood et al. (1996) expressly "does not invoke individual characteristics" (p. 640).[35] They explicitly reject the relevance of individual differences, including those such as those proposed by social bonding theory: "whether you like or dislike your father, it will be more convenient to smoke marijuana when he isn't around" (p. 640). Their prediction approach to the study of criminogeneity explicitly aims to isolate the effect on crime of characteristics of settings and environments and their circumstances from characteristics of the actor. Bernasco, Ruiter, et al. (2013) interpret this empirically in their study of criminogeneity by using a fixed-effect estimator to "eliminate between-individual factors as potential confounds" (p. 919). This study measures the relative and independent contribution of the absence of adult handlers in settings, alongside multiple other independent measures of the social context of action such as the structure of activity or presence of peers, in the prediction of crime. They find that find that the risk of offending is 6.31 times larger when unsupervised than in the presence of handlers (including parents) (Bernasco, Ruiter, et al., 2013).

The study by Bernasco, Ruiter, et al. (2013) is of particular interest because the nature of the data used means that the unit of analysis is events (hours) (see further, section 7.3.1:). This allows analysis of the effect of the presence of guardians and other setting features on behaviour in that same setting; however, the study is problematic. Like various presentations of both RAT (Cohen & Felson, 1979; Felson, 1986; Osgood et al., 1996) and social bonding theory (Hirschi, 1969), within which their study is rooted, Bernasco, Ruiter, et al. (2013) lack an underlying model of action and do not fully specify *how* the presence of parents and other supervisors influences adolescent action. They only discuss the mechanisms by which the absence of adult handlers may increase the likelihood of crime in vague terms, suggesting but not specifying the relevance of social bonds and social control (in particular, deterrence). Furthermore, they say nothing specific about how this effect might differ for different individuals. Their fixed-effects analysis explicitly removes individual differences to isolate a purely environmental (criminogenic) effect

[34] This is not to say that RAT precludes the possibility of individual differences. For example, Felson's (1995) attempted integration of RAT and Hirschi's social bonding theory in principle allows for the relevance of individual differences at least in terms of parent-child relations. However, individual differences are generally ignored by RAT in favour of differences in routine activities and criminogeneity when predicting the likelihood of acts of crime.

[35] Osgood et al. (1996) state that motivation is in the setting. After Briar and Piliavin (1965), Osgood et al. call it "situational motivation" but this conception of motivation is actually not truly situational as it doesn't differ for different people in the same environments (see further, section 2.3.3:).

of the presence of authority figures as advocated by (Osgood et al., 1996) (see also, section 7.3.1:).

This approach is in direct contrast to the situational model of SAT, which states that although particular features of the environment and setting are very relevant to engagement in crime in that setting, this is only really the case for certain kinds of people. Despite the challenges involved in such analyses (see chapter 7), this principle is increasingly being demonstrated empirically (Beier, 2017; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012).[36] As is the case when interpreting statistical interaction (see Edwards (2009) and also section 9.2.1:), interpretations of main effects are meaningless in the presence of interaction. This means that once it is established that individuals (and their features) and environments (and their features) interact in crime causation, the conclusions from studies of either individual features or environmental features alone are meaningless for a cause-oriented approach to crime prevention.[37]

5.3.1.2: Summary

Much of the existing literature on contexts of action actually represents predictions of the criminogeneity of settings and environments. The literature on the effect of the absence of parents and other guardians in settings is dominated by theories and studies that fundamentally rest on an assumption of a motivated offender, and therefore focus on control as the key feature of mechanisms by which the presence of guardians influences acts of crime. Whereas moral rules (including the moral content of features such as social bonds) are central to SAT and its conception of moral contexts, the literature on criminogeneity focuses on the deterrent role of parents and other guardians (e.g., increasing the likelihood and severity of sanctions and punishments). Within the framework of SAT, 'discouragers' such as parents and other guardians who are present in settings can influence the moral rules of contexts and not just their enforcement. Although this is implied in discussions of studies conducted in response to the literature on peer influence, it is not fully explored. Parents and other guardians can do more than just detect and sanction to influence situational processes that lead to acts of crime.

[36] This effect has also been evidenced in scenario studies of hypothetical behaviour (Eifler, 2016; Haar & Wikström, 2010; Pauwels, 2018, in press; Wikström, Oberwittler, et al., 2012).

[37] Bernasco, Ruiter, et al. (2013) state that questions of individual variation are 'interesting', yet do not address them. They argue that larger samples are required for analyses with sufficient statistical power (though this, in itself, may be a flawed argument, see Gelman, Skardhamar, & Aaltonen (forthcoming)). The argument presented here is that studying the main effects and ignoring individual differences (and individual-environment interaction), irrespective of the reason for doing so, can only render results that are at best inefficient and at worst misleading in terms of discovering the causes of crime and therefore the best prevention strategy.

The next section introduces SAT's perception choice process. Studies of criminogeneity lack such a model of action. Not only does this mean mechanisms are poorly specified in this literature, but individual differences are most often neglected or actively ignored. SAT however emphasises the importance of individual perception of the features of environments in the process that leads to action, meaning that it is the interaction between actors and their environment that is crucial for acts of crime. Since perception of the same environments by individuals varies, the effect of environmental features on action is dependent on features of individuals. For example, whether a guardian is 'capable' of deterring a crime or not is ultimately determined by the perceiver (the potential offender). Social bonds may influence differential perception such that the strength of the influence of the guardian may vary by proximity of the figure to the actor and their level of responsibility for them; however this does not provide a complete picture of the process by which the presence of guardians relates to acts of crime. Actors (and their characteristics) *in interaction* with their environment determine the effect of potentially criminogenic features of that environment on their actions. Studies of criminogeneity disregard this fundamental fact that is crucial for understanding acts of crime.

5.3.2: The perception-choice process

SAT states that actions (including crimes) are the outcome of a perception-choice process that is initiated by the coming together of a person with particular moral rules, moral emotions and ability to exercise self control (crime propensity) in a setting that is characterised by particular moral rules and their enforcement (moral context).

The perception choice process is the interactive process that integrates individual and environmental factors in the explanation of action in SAT.

5.3.2.1: Existing literature: Integrating people and environments

> *"Although additivity is plausible, it is nevertheless conceivable that one or another of the central variables is so important that it sets the parameters within which the other two can operate"*
>
> (Tittle, 1995, p. 15)

Section 5.3.1.1: argued that most research that aims to study crime events instead predicts criminogeneity. This is because such research lacks a model for the integration of features of individuals and environments in the situational explanation of crime events (see section 2.3:). This distinction between predicting criminogeneity and explaining events (such as acts of crime) is mirrored in the distinction between environments (or settings and their features) and behavioural contexts. Environments and settings exist and can be studied and described

independently of actors. However, SAT argues that actors, in settings, perceive action alternatives and choose to follow a course of action. Behavioural (action) contexts are therefore settings in which a particular act by a particular actor can or does take place.[38] Behavioural contexts cannot be studied independently of their actor.

Some studies of parental monitoring (or studies that study aspects of parental monitoring) include consideration of both individual (internal) and environmental (external) factors. Such attempts to integrate psychological and sociological perspectives are welcome, however, the method of integration is crucially important to a plausible explanation of action (see further, section 2.3:). Without an interactive model of rule guided action, detailed study of the mechanisms that link parental monitoring features and acts of crime is not possible. Neither control nor opportunity theories (which underlie much parental monitoring research) have an adequate model for integrating individual and environmental explanations of acts of crime.

For the control perspective, parental monitoring factors are relevant to both internal and external controls (section 5.1.1.1:). In their review of various theories within the control perspective, Britt and Rocque (2016) suggest that "internal controls may also overlap with external controls, and could be thought of as reflecting a continuum of control" (p. 186). However, whilst various control theories acknowledge that both internal and external controls can be relevant for behaviour; these are poorly defined and control theory generally lacks an adequate model by which they can be simultaneously delineated and integrated. This creates tensions in the general body of control literature. Arguably, the search for a solution to this deficit has led to many of the developments and changes in this body of theory and research. This is discussed in brief below in order to identify relevant and useful concepts for the situational study of parental monitoring and crime, and any problems with these.

A number of traditional control perspectives aim to explain conformity (and its converse, for example, crime) as a result of variations in ties to 'conventional social order' (e.g., Briar & Piliavin, 1965; Nye, 1958; Reckless, 1950; Reiss, 1951).[39] The most influential of these theories is Travis Hirschi's Social Bonding Theory (1969), which conceptualises external social control in terms of social bonds. Social bonds are the ties (connectedness or attachment) that individuals have to conventional social institutions such as the family, school, and peer group. Certain acts (such as criminal acts) may have negative social consequences which are particularly damaging

[38] For further general reading on the topic of contextual effects, see, for example, Blalock (1984).
[39] For a review, see Britt and Rocque (2016). Outside criminology, Hechter (1987) also takes a similar perspective with his Group Solidarity Theory. Hechter states that the role of personal ties (which arise from repeated interactions over time) are to create dependence and this dependence comes with obligation (i.e., to be compliant).

when they stem from particularly relied upon individuals (i.e., parents) (Hirschi & Gottfredson, 2003). The stronger the affection for and attachment to a person or institution "the more likely the person is to take it into account when and if he contemplates a criminal act" (Hirschi, 1969, p. 83).[40] In other words, Hirschi (1969) suggests that social bonding influences behaviour because behaviour is governed by its consequences, and that bonds to closely attached others such as parents may have a particularly strong influence over behaviour.[41]

Hirschi was limited in explaining acts of crime by aforementioned fundamental problems inherent in the control theory approach, but in addition, social bonds cannot fully explain crime. Some bonds encourage crime, and social controls don't always work. For example, Tittle (1995) states that habits, lack of alternatives, or internalised moral commitments mean that even an unbonded individual doesn't necessarily offend. These alternative reasons why a crime event might not happen are addressed by more comprehensive theories such as SAT. This is because SAT specifies a role for the morality of both individuals and settings, and can also account for the interaction of individual and environmental features (including both morality and controls). Social bonding theory draws attention to some crucial elements of the causal process leading to acts of crime, but is both incomplete and imprecise (Tittle, 1995).[42]

Wells and Rankin (1988) argue that research focus on testing Hirschi's (1969) social bonding theory was to the detriment of the development of a more inclusive understanding of family social control. Hirschi's social bond consists of attachment, commitment, involvement and beliefs (1969). Nye (1958) had previously provided a more inclusive (but less detailed) version of the content of social controls (Rankin & Wells, 2006). It includes indirect control (via effective attachments and emotional investments in social relationships), internalised control (changing beliefs through e.g., socialisation, conditioning), and opportunity control (manipulating situational behavioural alternatives from among which individuals can choose). There is much overlap and similarity between Nye's kinds of control and Hirschi's elements of social bonds (for a discussion, see Wells & Rankin, 1988). However, Nye's (1958) kinds of control were not limited to having effect through social bonds, and also included direct control (coercive use of

[40] A number of influential theorists take this view. For example, Sampson and Laub reference Hirschi, and also Durkheim and Kornhauser, when they state that their own overarching principle is that the "probability of deviance increases when an individual's bond to society is weak or broken" (1993, p. 18)

[41] The particular relevance of aspects of social bonding theory for situational mechanisms that link parental presence and knowledge to acts of crime is discussed further below.

[42] For example, the reported magnitude of relationship between social bonds and crime ranges from encouragingly moderate to discouragingly low and there is evidence that factors and mechanisms not included in Hirschi's explanation mediate the effects of social bonds (Agnew, 2003). One of the factors commonly found to mediate the relationship between social bonds (external controls) and crime and delinquency is self control (internal control) (Morris et al., 2011).

punishments and rewards to gain compliance with social rules). Such a broader conception of social control allows a role for parents in the socialisation of moral norms and control of exposure to particular environmental inducements, as well as their role in both direct and indirect controls. Unfortunately, Nye did not specify the nature of such a varied role for parents; and the influence of his theory on criminology was overshadowed by that of Hirschi's.

Others later also took a more inclusive view of parental controls, for example, Sampson and Laub, whose theory links "the child to family and ultimately society through emotional bonds of attachment and direct yet socially integrative forms of control, monitoring and punishment" (Sampson & Laub, 1993, p. 68). They built on Thornberry's 'interactional theory' (1987), which extended social bonding theory to show how the effect of controls on crime can vary over time. Both Thornberry and Sampson and Laub highlighted that the importance of attachment to parents for crime is more or less important at different times during childhood and adolescence. As adolescents become more autonomous and spend less time in the presence of their parents and other supervisors, the role of parental knowledge of the circumstances of unsupervised activity may be to somehow replace supervision as it reduces (see section 4.3.2:).[43] As well as taking account of changes over the life-course, Sampson and Laub combine both direct and indirect family informal social controls in their Age-Graded Theory of Informal Social Control (1993). A later formulation of their theory also dealt with criticism about a lack of consideration of human agency in control theory (e.g., Matza, 1964) by developing an element of situated choice (Laub & Sampson, 2003). This development also added consideration of routine activities, aging, macro events and structural factors, and community context and culture (Laub & Sampson, 2003). These additional elements provide potential ways in which parental presence and parental knowledge can influence the crime event, but crucially also allow for the influence of other factors. This theory is still ultimately a control theory because informal social control is the primary explanation of crime and desistance in the life course (Laub & Sampson, 2003; Sampson & Laub, 1993).

These are all examples of the inclusion of both individual and environmental controls in conceptions of acts of crime. However, all of these control perspectives are fundamentally limited by their inability to adequately delineate and ultimately, to integrate internal and external controls in an explanation of action.

[43] The present study does not focus on changes in parental monitoring over time. However, it captures an age range when both supervision and parental knowledge may be exerting influence on action.

The tensions in control theory between explanations of behaviour involving internal or external controls are perhaps responsible for the change during Hirschi's career from emphasising indirect external controls (i.e., social bonds and parental attachments; Hirschi, 1969); towards emphasising internal controls (i.e., self control; Gottfredson & Hirschi, 1990);[44] and eventually to an attempt to integrate the two perspectives (Hirschi, 2004). Hirschi came to see self control in childhood as more a function of social control (Morris et al., 2011), however, Hirschi's (2004) theoretical revision leaves the conceptions of both self control and social bonding unclear (Vaughan, Bouffard, & Piquero, 2016, p. 2) and the distinction between them more blurred than in the original self control theory. Apparently, the self control of the child and the social bond between the parent and child are "very difficult to discriminate empirically and, under some circumstances, may amount to the same thing" (Gottfredson, 2006, p. 86). According to the reconceptualisation of self control, the concept can even be captured, in part, by measuring the level of attachment to parents (i.e., the social bond) (Gottfredson, 2011; Hirschi, 2004).

Some empirical research attempted to test Hirschi's integration of social control theory and social bonding theory (e.g., Longshore, Chang, & Messina, 2005; Vaughan et al., 2016). Importantly, the findings of one of these studies "support the need for the conceptual separation of bonds, attitudinal and decisional self-control as well as increased attention to differential effects of self control" (Vaughan et al., 2016, pp. 1-2). The authors suggest that an alternative theory is needed, and even that SAT may well be the way forward (Vaughan et al., 2016).[45]

Whilst Britt and Rocque (2016) imply a straightforward 'continuum of controls'; it is problematic for various control theories that internal and external controls are not clearly and consistently defined, do not have a discrete boundary and that the specifics of the process(es) by which they interrelate is not convincingly stated. These problems stem from the absence of a model to integrate individual and environmental factors in the explanation of acts of crime. Such vague conception of key variables is highly problematic for the accurate specification of processes that link parental monitoring and crime, and hinders operationalisation and empirical testing.

Opportunity theories including those within the routine activities perspective recognise in principle the importance of both individuals and environments (e.g., Cohen & Felson, 1979), but do not explain *how* their convergence produces a causal process that can bring about acts (of

[44] For a discussion of Hirschi's changing conception of controls during his career, and how this may not be as radical as it may first appear , see, Chriss (2007); Taylor (2001).

[45] Chriss suggests that the move between and subsequent combination of social bonding theory and self control theory is consistent with and actually subsumed within the earlier and more comprehensive functionalist theory of Talcott Parsons' AGIL schema (Chriss, 2007). The suitability of this sociological theory for this study has not been assessed.

crime) (Wikström, 2010a; Wikström et al., 2010).[46] In this sense, RAT does not adequately account for different levels of explanation. Felson (1995) combined a social control theory conception of the long-term formation of social ties with the concept of short-term effects of direct supervision inherent in routine activities theory in a 'two-step social control model'. Grounded in opportunity theory, this model assumes that human nature is self-interested as opposed to rule-guided and emphasises the role of controls. It does not adequately explain *how* external and internal controls integrate to influence action and therefore fails to specify in detail *how* social ties and supervision influence action.[47]

The theoretical shortcomings of the control and opportunity paradigms are apparent in work undertaken within them. Some recent examples of parental monitoring studies advance the state of the literature by including psychological and sociological factors but are nevertheless ultimately fundamentally flawed because they lack an adequate model of action and are predicated on the assumption of a motivated offender.

A recent study of parenting acknowledges the need to take account of both individual and environmental factors in crime causation (Janssen, 2015; Janssen, Eichelsheim, Deković, & Bruinsma, 2016). The study expressly aims to "examine the relative contribution of the proposed mediators derived from different theoretical perspectives (i.e. self control, delinquent attitudes, peer delinquency, time spent in criminogenic settings) to explaining the relationship between parenting and adolescent delinquency" (Janssen, 2015, p. 12). This study takes inspiration from self control theory (Gottfredson & Hirschi, 1990), differential association theory (Sutherland, 1947), and routine activity theory (Cohen & Felson, 1979), none of which have a developed theory of action.[48] Although it acknowledges exposure as an important part of the picture, the study itself lacks an action process by which individual and environmental explanations may be integrated. As a result, the analytical approach is additive and predictive as opposed to interactive and explanatory (as would be determined by a developed theory of action). A genesis in RAT means that, like RAT, the study cannot explain *how* the convergence of the relevant factors results in acts of crime (see further, Wikström et al., 2010). In addition, the study is implicitly

[46] Felson himself states that knowing about the convergence of entities goes "a long way in understanding crime rates and their variance over space and time" (Felson, 1986, p. 128), but despite the implication, he stops short of stating that this means that RAT cannot explain individual acts.

[47] An additional example is 'dynamic multicontextual criminal opportunity theory' (Wilcox et al., 2003). This theory explicitly states that it takes account of both individuals and environments in the explanation of events, but is grounded in opportunity theory (RAT) and control theory (social bonding theory) and therefore, like these theories, does not actually adequately do so.

[48] Given the interest in both individual and environmental levels of explanation (the integration of which is the cornerstone of SAT), and the particular choice of explanatory variables (all being key to SAT), it is surprising that this study did not choose to conduct analyses within the framework of SAT, which would allow and specify integration of these variables within an existing explanatory integrated action theory.

rooted in theories that understand human action to be self interested as opposed to rule guided. This means that even though it includes a measure of rule guidance, the study cannot address the specific role of delinquent attitudes and how this relates to the role of self control, because it cannot circumvent the problems inherent in its fundamental assumption of motivation and the ubiquitous relevance of controls.

This study provided the basis for further research that had the express purpose of studying interactions (Janssen, Weerman, et al., 2017). This study initially appears to hold much promise for the study of the role of parental monitoring in interactive situational processes delineated by SAT. However, Janssen, Weerman, et al. (2017) conflate levels of explanation, which means tests of these processes are miss-specified and the lack of a suitable guiding framework means that the studied interactions were not of the kind that integrate individual and environmental factors in the explanation of acts of crime. Ultimately the various conclusions of the study are at best disappointing and at worst incorrect. The study does attempt to address a range of mechanisms by which aspects of parenting can influence eventual crime outcomes, which means that some of the findings can be reinterpreted within a more suitable theoretical framework, though this will not be detailed here. Janssen, Weerman, et al. (2017) divide the proposed factors into direct protective factors (in SAT terms these seem most relevant to developmental processes) and buffering protective factors (most like short term situational processes), however, unfortunately, a weak theoretical framework means that they otherwise conflate these mechanisms in empirical models and theoretical discussion. For example, the test of proposed mechanisms that are most like short term situational processes is conducted using data that is most suited for studying developmental processes (i.e., cause and effect are captured two years apart and data is measured at the individual rather than event level (Janssen, Weerman, et al., 2017) – for discussion of situational data and analysis see further chapter 7). This test does not find interactive effects, but SAT would not hypothesise interactive effects of this kind in a model that more closely captures developmental processes. The authors do find interactive effects in tests that most closely resemble aspects of the social model of SAT (processes of personal emergence); however the interactive mechanisms inherent in such developmental processes are not specified by the study. Application of SAT would guide and therefore better specify the empirical analysis, theoretical discussion and implications for prevention.

Laird et al. (2010) raised hope for a study of parental monitoring and crime that truly addressed person-environment interaction. They criticised the new wave of research that was not finding a link between active parental monitoring strategies and anti-social behaviour outcomes (e.g.,

Keijsers et al., 2010; Keijsers et al., 2009; Kerr et al., 2010) for focussing only on main effects and instead looked for a differential effect of monitoring by certain situations and contexts. They concluded that "although monitoring may not be necessary or effective in all situations, monitoring is an effective strategy for inhibiting antisocial behaviour when adolescents are not directly supervised and when adolescents are inclined to resist or challenge their parents rules and authority" (Laird et al., 2010, p. 1440). This represents an encouraging acknowledgement that parental monitoring might not always be crucial to offending, and only relevant under certain circumstances. However, Laird et al. (2010) do not specify mechanisms by which parental monitoring might reduce offending (particularly in certain contexts)[49] and fail to specify developmental and situational roles for parental monitoring and distinguish between contexts of development and contexts of action. As such, the paper does not discuss how or why active parental monitoring of unsupervised time or of participants who reject their parents' authority to regulate friendships and activities might be effective in reducing adolescent crime.

The perception choice process is the situational process that integrates individual and environmental explanations of crime in SAT. Such an interactional explanatory model of rule-guided action is missing from existing attempts to integrate people and environments in studies and models that are relevant to the study of parental monitoring and crime.

Psychological presence

This chapter has drawn attention to fundamental flaws in control theory generally; and also to how Hirschi's social bonding theory neglects the content of bond. However, if applied within an SAT framework that addresses many of the problems inherent in control theory, elements of Hirschi's theory, the concept of psychological presence in particular, remain very relevant to the study of the situational process that links parental monitoring and crime.

Hirschi (1969) argues that the desire to avoid negative social outcomes means that adolescents consider how a parent might react to their behaviour if they were present in a particular setting, even when they are absent. Adolescents with close relationships to one or both parents are less likely to commit acts of crime, because such bonds function as a source of 'virtual supervision'. For Hirschi's (1969) social bonding theory, parents need not be physically present, but can be 'psychologically present' in the individual. Hirschi states the following by way of a mechanism that links this indirect supervision with fewer acts of crime:

[49] Laird et al. (2010) explicitly state that "descriptive studies need not be informative about the most effective way to change behaviour via intervention". (pp. 1438), though that they state that parental monitoring is an 'inhibiting' factor implies a control perspective approach.

> *"We assume that the supervision…is indirect, that the child is less likely to commit delinquent acts not because his parents actually restrict his activities, but because he shares his activities with them; not because his parents actually know where he is, but because he perceives them as aware of his location. Following this line of reasoning, we can say that the more the child is accustomed to seeking or getting their opinion about his activities, the more likely he is to perceive them as part of his social and psychological field, and the less likely he would be to neglect their opinion when considering an act contrary to law – which is, after all, a potential source of embarrassment and/or inconvenience to them"*
>
> (Hirschi, 1969, pp. 89-90)

Hirschi (1969) did not provide much detail in terms of how the psychological presence of parents might reduce the likelihood of acts of crime. Warr (1993, 2002) built on Hirschi's concept of psychological presence to try to explain how adolescents are still influenced to conform by their parents, even in the face of strong peer pressure to offend. In line with social bonding and social control theories, Warr stated that adolescents who are closely attached to their parents are more likely to avoid the loss of parental approval and affection that may result from offending, but he also highlighted that closely attached adolescents are more likely to internalise and act upon their parents' moral rules. However, although Warr draws useful attention to the potential conflict between different influences on adolescents (i.e., parents and peers), details of the mechanisms by which the psychological presence of parents can influence action are lacking. Just as the literature struggles to adequately specify how physical parental presence in settings may relate to crime, the details of the mechanism by which psychological presence may be effective in reducing crime are equally neglected.

Despite a lack of detail, some particular elements of Hirschi's ideas about the mechanism that makes the social bond effective in controlling acts of crime are very relevant to broader considerations of the situational role of the psychological presence of parents in settings (as captured by a measure of perceived parental knowledge). The concept of psychological presence provides a conceptual link between the two elements of parental monitoring under study in this thesis, i.e., perceived parental knowledge and the physical presence of parents (and other guardians) in settings. Specifically, application of Hirschi's conception of virtual supervision and psychological presence within an SAT framework means the concept can be developed and extended to clarify the relationship between direct and indirect controls; and it can provide a basis for developing the plausible mechanisms that link parental knowledge of the circumstances of unsupervised activity and crime (section 6.1:). Further, application of SAT broadens the conceptual influence of psychological presence (and similarly physical presence, see above); conceiving of their influence not just on controls, but also the moral rules of settings (section 6.1:).

5.4: Summary

This chapter has outlined three major problems with the literature on parental monitoring and crime. First, the body of research cited above together attempts to capture the relationship between a range of proposed causal factors (e.g., parental supervision, parental knowledge, child disclosure, and other variables proposed as crucial measures of parental monitoring), and a range of behavioural outcomes (e.g., crime, substance misuse, anti-social behaviour, conduct disorder), among a range of populations in a range of locations and contexts. Despite the breadth of this research, explicit discussions about the specific mechanics of how and why good parental monitoring, supervision and knowledge might result in lower levels of negative behavioural outcomes are either entirely absent, or opaque and vague. In part this incoherence is due to idiosyncratic definitions of key concepts (chapter 4); but it is also reflective of the common focus on description rather than explanation in criminological research. Section 1.2: argues that in order to reduce adolescent offending, we must understand the causes of crime by young people. In relation to the particular aspects of parental monitoring focused on in this study, the important questions for crime prevention are precisely *how* and *why* the presence of guardians in settings or an adolescent's perception of their parents' knowledge about the circumstances of their activities might influence their offending. The current literature does not adequately address these questions, and therefore fails to inform effective policy and practice. This is because i) poor specification of the mechanisms by which these features of parental monitoring influence action means that their impact on crime is either lost or appears important for all individuals, meaning that recommendations for policy either over- or under-estimate the potential efficacy of parental monitoring prevention measures in relation to other prevention measures; and ii) understanding the nature of the interrelationship of parental monitoring with other parts of the causal (interactive) process is essential to understanding corresponding (potentially problematic) interaction and interrelationship between crime prevention measures.

Secondly, this body of research also fails to integrate environmental and individually focussed descriptions and explanations of acts of crime which severely limits its explanatory power. The parental monitoring literature lacks research into the situational dynamics of adolescent offending. In other words, the role of the presence of guardians and perceived parental knowledge in the interaction between individual and environmental factors in acts of crime is very under-researched. This is no doubt due in part to myopia within both the theoretical and empirical literature. It is also undoubtedly due to the considerable complexities inherent in collecting situational data and testing situational mechanisms. These methodological and

analytical challenges are discussed in detail in chapter 7. Parental monitoring research aside, most situational processes are under researched due to the rare integration of individual and environmental levels of explanation and the scarcity of truly situational data with which to test explanations.

Thirdly, mechanisms of control dominate the parental monitoring literature because most studies are underpinned by a flawed conception of the nature of human action. This means that the role of the presence of guardians and parental knowledge in processes that involve personal or contextual moral rules are neglected.

Existing presentations of SAT outline the mechanisms by which factors such as parental monitoring can plausibly influence acts of crime, and also integrate individual and environmental approaches in a situational model of crime causation. The next chapter will develop SAT to specify the details of these mechanisms as they apply specifically to perceived parental knowledge and the presence of guardians.

6 The physical and psychological presence of guardians and crime: A situational model

> *"Acts of crime happen because people perceive them as a morally acceptable action alternative given the circumstances (and there is not relevant and strong enough deterrent) or fail to adhere to personal morals (i.e., fail to exercise self-control) in circumstances when they are externally incited to act otherwise"*
>
> (Wikström & Treiber, 2016a, p. 428)

> *"Supervision (the presence of an adult guardian) is a dimension of young people's activities that is highly relevant to their social behaviour, as it plays a critical role developmentally in their socialisation, and situationally in their rule-breaking. An adult guardian is typically responsible for monitoring behaviour and enforcing rules, and in some circumstances asserting those rules, and therefore generally strengthens the moral context (although guardians will differ in the degree of and efficacy with which they monitor behaviour and enforce rules of conduct)"*
>
> (Wikström, Oberwittler, et al., 2012, p. 277)

> *"The important consideration is whether the parent is psychologically present when temptation to commit a crime appears"*
>
> (Hirschi, 1969, p. 88)

The overall aim of this chapter is to propose mechanisms (within an integrated theory of action) by which i) the presence of parents or other guardians and ii) perception of their parents' knowledge of the circumstances of activity when not present, can influence the situational process by which adolescents perceive and choose crime as an action alternative. Effective crime prevention requires explanations of crime (as opposed to predictions), and parental monitoring may be a particularly fruitful area of impact for crime prevention efforts (Part I).

The presence of guardians and perceived parental knowledge of the circumstances of activity are not necessarily the most theoretically or empirically impactful factors involved in parental monitoring, but it is important to clarify how and when they do and do not influence crime. This is because they are the parental monitoring factors most commonly researched and most commonly and consistently (strongly) associated with behavioural outcomes such as crime; yet are also often researched using unspecified, miss-specified or conflated concepts (chapter 4), and the mechanisms by which they may influence crime outcomes are rarely, and if so poorly, specified (chapter 5).

Integration of existing parental monitoring research and SAT is summarised in chapter 5. Examining all of the processes outlined in this integrative exercise is beyond the scope of the present study; which instead focuses on part of SAT. Situational mechanisms are often neglected, misconceived, misinterpreted or poorly measured (see section 5.3: and chapter 7); this motivates a further focus on the situational perception-choice process by which the presence of guardians and perceived parental knowledge of the circumstances of activity are related to crime.

This chapter combines insights from the newly-organised parental monitoring literature with ideas presented in this thesis so far within the framework of a theory of situational action in order to detail plausible situational mechanisms that link the presence of guardians and perceived parental knowledge of the circumstances of activity with lower rates of adolescent crime.

Chapter 4 defined the presence of guardians and perceived parental knowledge. The first part of this chapter argues that these represent the related concepts of physical and psychological presence of guardians in settings and introduces the issues relevant to the effect these may have on the situational process that leads to acts of crime. The second part of this chapter summarises SAT's situational model, and goes on to detail the proposed effect of the physical and psychological presence of guardians in settings on elements of the perception choice process. The final part of this chapter derives some specific testable implications (i.e., hypotheses) from this theoretical development, which provide the basis for the empirical content of this thesis (part IV).

6.1: Physical and psychological presence of guardians

The physical presence of parents and other guardians in settings is one of the measures of interest in this thesis. Viewing the existing literature through the lens of SAT in chapter 5 focused attention on the under-studied role of the presence of parents and other guardians in shaping the context of action (moral rules and their enforcement). It also introduced the concept of psychological presence, which has been captured using a measure of perceived parental knowledge of the circumstances of activity (Hirschi, 1969). Perceived parental knowledge is the other measure being examined in this thesis, but i) its suitability for representation of the concept of psychological presence and ii) the role psychological presence plays in the action process are not well developed in the literature. The bulk of this chapter (section 6.2:) specifies the ways in which both physical and psychological presence impacts on moral rules and their enforcement and therefore ultimately on situational elements that are relevant to action (i.e., motivation, perception and, sometimes, choice). This section (section 6.1:) introduces general issues relevant

for this specification, and discusses the similarities and relationship between the concepts of the physical and psychological presence of parents and other guardians.

Section 6.2 details effects on specific elements of the situational process that leads to action, but in general terms, how does the presence of parents and other guardians in settings have any effect on the action process? Essentially, since settings are external and yet actions are carried out by individuals, this question is about how the external becomes internal. This question has proved problematic throughout the history of parental monitoring literature because it is also problematic for control theories (see section 5.3.2.1:). The answer lies in the integration (interaction) of individuals and environments in the action process, which is the cornerstone of SAT. At the heart of this process is an individual's perception of their environment and its features and circumstances, which means that the salience of environmental cues is crucial.

Social bonding theory states that what links the internal (individuals) and the external (society) are social bonds, and that social bonds are emotions, expectations, time and rule-following (Hirschi, 1969). As Wikström and Treiber (2009a) point out, social bonds such as these don't actually exist in environments with which people come into contact. Instead they are subjective and exert their influence at the individual level. However, they are acquired via contact with external factors (for a discussion, see also, Treiber, Forthcoming). What people encounter in settings and social interactions are cues. These are conscious and unconscious reminders of their social bonds and the implications of their behaviour on these bonds.

The importance of attachment for the social bond is one reason why social bonding theory sees parents and other guardians as so important for crime prevention (e.g., Hirschi, 1969).[1] The theory is, however, i) not consistently clear about what social bonds are (for example, Hirschi (2004) conflates the social bond with both self control and attitudinal measures) and is ii) not specific on details of the mechanism that links the social bond to action (see further, chapter 5). Furthermore, the salience of bonds (including attachment bonds to parents) becomes a crucial feature of action contexts for social bonding theory (Hirschi, 2004); however, the salience of social bonds is poorly conceptualised and, problematically, not allowed to vary between individuals or settings (Morris et al., 2011; Piquero & Bouffard, 2007; Vaughan et al., 2016).

The mechanism by which the presence of parents and other guardians reduces rates of crime (i.e., the *how* question) is not well developed (see chapter 5) and, with regards situational

[1] Other conceptions about parents and other guardians that are ultimately based on social bonds also cite parents as key figures, for example, Felson (1995) states that parents and appointed guardians have a higher degree of responsibility for adolescents.

processes, is the subject of this chapter. Crucial to this is a clear understanding of what social bonds are and how they are relevant to the relationship between social contexts (including the presence of parents and other guardians in settings) and action (including acts of crime).

The way in which the presence of parents and other guardians in settings influences action is by providing cues that activate the effect of the social bond on action. By thinking about the impact on action of the presence of parents and other guardians in settings within the framework of SAT, it is possible to break down its impact on actions by detailing the effect it may have on each part of the action process (see section 6.2:). This is not possible within theoretical frameworks that lack a model of action such as social bonding theory.

The discussion about social bonds draws attention to the concept of salience; and to the potential differing salience of bonds (and therefore also the salience of people and their actions)[2] for actors both across different settings and in general. When thinking about the effects of social environments on action, the concept of salience highlights the distinction between objective environmental facts and the actors' subjective perception of those facts. Perceptual environments have been discussed in interactional psychology (see section 2.3.2:), however, these were seen as a different classification of environment and this sadly did not lead to an emphasis on perception in the conceptualisation of the action process. By contrast, perception is of prime importance to the process of action for SAT; it is an individuals' perception of an environment and its characteristics that is crucial for their action (Wikström, 2006).[3] For example, since people are the source of their actions, the fact of the presence of a policeman in a setting can have no causal efficacy on an individuals' behaviour in that setting; only their perception of that presence may have some bearing on the process that leads to their behaviour. In their test of SAT, Hirtenlehner and Hardie (2016) state that in conjunction with individual propensity, "it is the subjectively perceived and not the objective moral context that guides individual behaviour" (p. 319).

This means that it is not just objective features of environments that can influence action. Features of the interaction between environments and actors (i.e., perceived features of contexts) can also influence the action process. This is because by being salient, subjective features can cue

[2] In the case of psychological parental presence, it is the salience of the parental knowledge that is important.

[3] Perception is also important to another integrative theory of action - the Model of Frame Selection (Esser, 2009; Esser & Kroneberg, 2015; Kroneberg, 2014), though this theory is not the framework for this thesis (see section 2.3.4:). The academic constructs that underlie MFS (e.g., mental models, schemas, frames and scripts) help guide ideas about cues in settings and how these can activate and guide perception. These may prove useful to future discussion and theorising about the role and impact of physical and psychological presence on setting cues that are relevant for behavioural outcomes through a process of perception and choice.

(activate) those same processes that are activated by objective features.[4] Such subjective features are not internal to the individual, nor are they external features of environments, but are situational. They exist in and are features of the actor's perception (i.e., their response to the setting).

For example, Hirschi's concept of 'virtual supervision' is "psychological, cognitive, something you carry with you" (Travis Hirschi, speaking to John Laub; Laub, 2011, pp. 318-319). For Hirschi, virtual supervision cues the social bond in the absence of the supervisor (Hirschi, 1969), and this virtual supervision "differs in important ways" (Travis Hirschi, speaking to John Laub; Laub, 2011, pp. 318-319) from the direct control afforded by direct supervision (which in turn fosters self control (e.g., Gottfredson & Hirschi, 1990)). These seemingly opposing concepts and processes of supervision have never been adequately aligned or reconciled. Hirschi himself recognises that supervision (including virtual supervision) is a concept much affected by the challenges inherent in his changing conceptions of internal and external controls (Laub, 2011),[5] and in the control literature generally (for discussion, see chapter 5).

The situational model of SAT allows for the situational influence of both the psychological and the physical presence of parents and other guardians on both the moral rules and their enforcement (external controls) in settings. In addition, by focusing on perception, application of SAT helps to clarify the relationship between physical and psychological presence, and suggests that since the effect of the presence of guardians in settings can only be realised through the adolescents' perception of this presence, psychological presence can also have some effect via the same processes.

There is a point of logic to make about the physical presence of parents that is not relevant to psychological presence. The physical presence of a particular adolescent's parent means also the presence of another adolescent's 'other guardian'. Therefore the physical presence of an actor's

[4] Although this won't be discussed further here, note that not all individuals have equal perceptual ability (Kroneberg, 2014); and selective and biased perception (see section 6.2.2:) may also vary which cues activate processes across different individuals.

[5] Historical developments in Hirschi's theorising have implications for conclusions about which of these kinds of supervision he deemed important. Early on, virtual supervision was crucial (as a mechanism by which social bonding can influence unsupervised behaviour; Hirschi, 1969); then direct supervision was most important (for the development of self control; Gottfredson & Hirschi, 1990). Finally, he concludes that although the importance of virtual supervision should never have been 'lost' to direct supervision, virtual supervision is important insofar as it is subsumed by self control (Laub, 2011). Taken together, Hirschi's body of work (e.g., Gottfredson & Hirschi, 1990; Hirschi, 1969, 2004) and stated opinion (Laub, 2011) seem to imply that direct supervision is important for the development of self control, and virtual supervision *is* self control. Hirschi clearly feels that there is a role for both conceptions of supervision, because he even suggests that the changing conception of supervision between social bonding theory and self control theory "may well be the place to look for reconciliation of the two perspectives" (Travis Hirschi, speaking to John Laub; Laub, 2011, p. 319).

parent can influence the context of others present in the setting and not just that of the actor, which in turn can have implications for aspects of the moral context (for examples, see section 6.2:). Sampson's (1992) neighbourhood level explanation of social disorganisation is relevant to this argument. Sampson states that weak family controls aggregate to the neighbourhood level and have an effect on adolescents that is independent of that of their own families; parents may therefore have direct control effects on children other than their own by adding to monitoring and supervision in the neighbourhood (Sampson, 1992).[6] Although Sampson's theory is control focused and is not a situational theory, it draws attention to the possibility that the nature of an individuals' action context can be influenced by parents and supervisors other than their own.[7]

What is psychological parental presence? The concept refers to adolescents taking their parents with them cognitively. There are neural mechanisms by which parental presence becomes internalised. For example, particular experiences can establish new neural pathways via activity-dependent synaptogenesis (Zito & Svoboda, 2002), and repeated experiences (e.g., presence and salience) can strengthen pathways via a process of long-term potentiation (Malenka & Nicoll, 1999). Together these provide neural mechanisms by which parental presence and salience (e.g., of content) over time means that adolescents 'take parents with them' in cognitive terms. Much like external cues activate the effects of physical presence; external cues can also activate the effects of psychological presence.

Parental knowledge of the circumstances of their activity in particular settings is one such cue that, via its perception by individuals, can activate the effects of psychological presence.[8] It is thus as a measure of psychological presence that the situational role of adolescent-perceived parental knowledge of the circumstances of activity in acts of crime is theorised in this chapter.[9] An adolescent's awareness of their parents' knowledge of the circumstances of their activities

[6] Multi-level explanations of social control such as Sampson's (1992) are a response to individual level 'atomistic' approaches to processes of family controls (for discussion, see, Britt & Rocque, 2016; Rankin & Wells, 2006).
[7] Cleveland, Feinberg, Osgood and Moody (2012) find a relationship between the parenting style of adolescent's peers' parents and that adolescent's substance use behaviour; however, although many are briefly discussed, no mechanism to explain this relationship is proposed in detail.
[8] There are other cues that can make parents psychologically present in settings. These include parenting behaviours that are related to parental monitoring (one example is absent parents texting their children).These will not be discussed further here; however, the discussion in this thesis can be applied in future to the study of other such cues.
[9] As outlined in chapter 5, there may be additional roles for parental knowledge of the circumstances of activity in other processes described by SAT. However, there are different measures of parental knowledge (see section 4.3.3:). The mechanisms in which actual parental knowledge, parental knowledge as perceived by parents or others, or parental knowledge as perceived by adolescents may each be implicated are quite different. Actual parental knowledge factors may be related to those implicated in processes of social emergence and social selection which impact upon crime propensity and criminogenic exposure respectively, and which differ widely from the role for adolescent perceived parental knowledge in the situational mechanism that links perceived parental presence and acts of crime proposed here.

creates a psychological parental presence in settings. Although Hirschi (1969) did not make detailed specifications, his operationalisation of psychological presence (virtual supervision) provided the impetus for this theoretical development. Hirschi (1969) captured virtual supervision empirically using two questionnaire items that ask adolescents if a parent knows where they are and whom they are with when they are away from home (i.e., adolescent-perceived parental knowledge of the circumstances of activity). Although Hirschi doesn't explicitly delineate social and situational processes, his concept is applicable to the study of the role of perceived parental knowledge in situational processes because i) it implicitly invokes the actor (psychological presence requires perception by the actors in settings and cannot be a feature of just environments) and ii) it focuses on the effect of psychological presence on the act of crime rather than on criminality or processes of selection (see section 5.2:). Hirschi's conception also helps to draw attention to issues relating to the concept and measurement of parental knowledge by acknowledging that child disclosure is an important source of parental knowledge (see section 4.3:), and yet also that it is the child's *perception* of their parents' knowledge about the circumstances of their activities and not the parent's actual knowledge that is of most importance for action.

6.1.1: Summary

> *"The important consideration is whether the parent is psychologically present when temptation to commit a crime appears"*
>
> (Hirschi, 1969, p. 88)

In his Social Bonding Theory, Travis Hirschi applied the term 'virtual supervision' to parental knowledge of circumstances of action; suggesting young people who perceive their parents to know their location and companions feel that their parents are 'psychologically present' (Hirschi, 1969). Social Bonding Theory itself does not go on to detail the mechanism by which such 'virtual supervision' could influence behavioural outcomes. Although Hirschi does not elaborate on the mechanism, his concept of psychological presence provides the impetus for this study to theoretically situate the measure of parental knowledge that is so often captured in studies of parental monitoring within the causal framework of SAT. The psychological presence of parents (captured by adolescent-perceived parental knowledge of the circumstances of activity) and the physical presence of parents and other guardians become similar features of contexts, distinguished only by the actual (as opposed to perceptual) presence of the guardian. In the remainder of this chapter the term presence can refer to both psychological and physical presence.

A major difference between the concept of psychological presence in social bonding theory and that which is developed here within SAT is the point at which the salience of the parent is relevant. For social bonding theory, which is rooted in control theory, the emphasis is on controls and therefore the process of choice (see further, section 5.1.1.1:), whereas for SAT, the role of controls is conditional only and the salience of parents can play a role in all parts of the situational process that leads to action (i.e., motivation, the perception of alternatives and habitual action, in addition to deliberative processes).

A specific contribution of this thesis is the theoretical development and empirical testing of the role of psychological presence of parents in contexts (alongside and independent of the physical presence of guardians) in the situational process leading to acts of crime. The physical presence of parents and other guardians is a cue that makes them psychologically present. Other cues such as the adolescent perception of parental knowledge of the circumstances of activity makes parents psychologically present when they are physically absent. The following section details what psychological presence does to the perception of the moral context and enforcement (and thus motivation and the moral filter) and its impact on the process of choice.

6.2: The situational model

> *"Motivation directs attention towards an action goal, initiating the action process. Perception is the process through which a person identifies possible action alternatives for obtaining a particular action goal in response to a motivation. Choice is the process through which a person selects which alternative to pursue, forming an action intention, which he/she will carry out if there is no interference"*
>
> (Treiber, 2017a, pp. 94-95)

SAT's situational model is introduced in section 5.3: and specifically states that the interaction between a person's crime propensity and his or her criminogenic exposure initiates a perception-choice process that guides action (Treiber, 2017b; Wikström, 2006, 2014, 2017; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012; Wikström & Treiber, 2016a). The perception choice process is therefore the interactive process that integrates individual and environmental factors in the explanation of action in SAT (see further, section 2.3:).

The perception-choice process is a two-step process because it involves a person i) perceiving alternatives for action and ii) making choices about action. Therefore, people commit acts of crime because they come to see an act of crime as an action alternative (perception) and choose to carry out that particular crime (choice). Motivation initiates this action process because the perceptions and choices are made in response to temptations and provocations (motivators). The

moral filter determines which action alternatives are perceived in response to the particular motivation. The moral filter is dependent on the interaction between a person's moral rules (and moral emotions) and the moral norms of the setting. This means that the particular alternatives an individual perceives (which may include an act of crime) and the choices he or she makes from among those alternatives (whether or not to do the crime) depend on the interaction between his or her own crime propensity and the criminogenic features of the setting. A person's own moral rules may or may not be in accordance with those of the setting. If there is conflicting rule guidance about the crime as an action alternative then an actor must deliberate, and only at this point do controls (deterrence and self-control) become relevant to the outcome.

SAT divides action decision-making into three key sub-processes of motivation, perception and choice (Wikström, 2006). The key constructs of the situational model, and their relationship to each other, are presented in Table 3. Treiber (2017b) usefully depicts the situational elements of Wikström's SAT in a figure that is reproduced in Figure 5.

Table 3: Key constructs of the situational model and their relationships

Situation	**=**	**Person**	**x**	**Setting**	**Affects**
Motivator:					
1. Temptation		a. Desires (needs) b. Commitments		Opportunity Opportunity	Goal-directed attention
2. Provocation		Sensitivity		Friction	
Moral filter		Morality		Moral norms	Perception of action alternatives
Control		Ability to exercise self-control		Capacity to enforce moral norms	Process of choice
		Propensity	**x**	**Exposure** **=**	**Action**

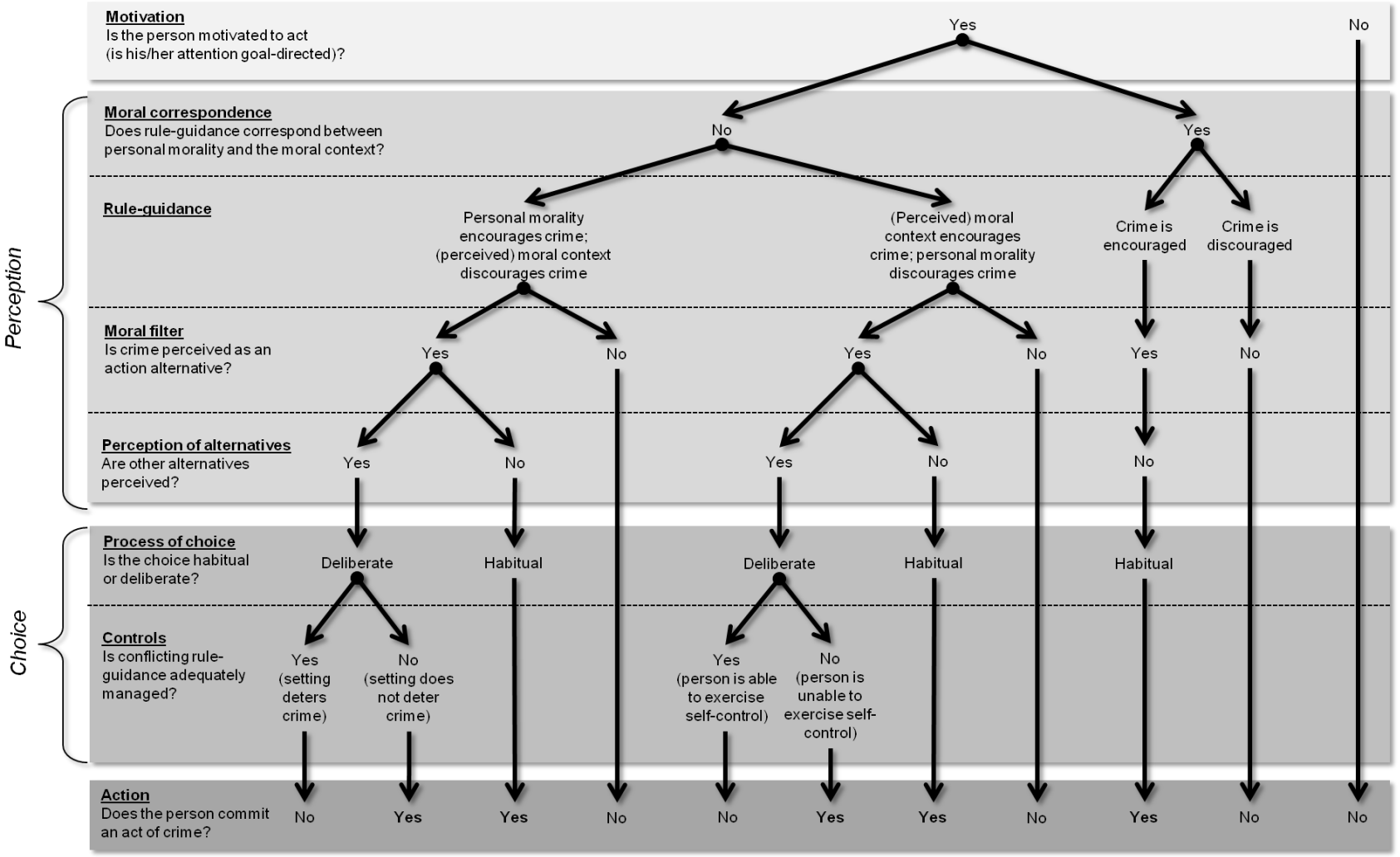
Table reproduced from (Wikström, Oberwittler, et al., 2012, p. 28)

Sections 6.2.1:, 6.2.2:, and 6.2.3: uses SAT's clear specification of these sub-processes as a framework and thus regular reference to Table 3 and Figure 5 will aid understanding. The theoretical development in this section breaks new ground to consider the specifics of how i) the presence of parents and other guardians in an action context or; ii) the child's belief that their parents know the circumstances of their action context; might influence motivation, perception and choice at various points in this situational process.[10] The specifics of these sub-processes represent situational mechanisms by which the absence of guardians and the perception of poor

[10] While considering the situational model it is important to keep in mind the very specific meaning of situation that is so crucial to SAT: "the perception of action alternatives and process of choice, which emerges from the person-setting interaction" (Wikström, Oberwittler, et al., 2012, p. 15). More detail about the situational approach is provided in section 2.3:. Motivation, the perception of action alternatives and the process of choice are all situational in nature for SAT because they are dependent on the interaction of the actor and the action context.

parental knowledge can plausibly play a role in crime involvement. Crucially, these mechanisms also suggest under what circumstances an absence of guardians and a perception of poor parental knowledge is less relevant for crime involvement. In comparison to the existing literature, this approach highlights the crucial importance of the content of personal and setting moral rules and the only conditional relevance of personal controls and setting level deterrents and enforcement.

Figure 5: The situational action process



Source: Treiber (2017b); see also Wikström (2017).

6.2.1: Motivation

> *"According to SAT, motivation (defined as goal-directed attention) is a necessary but not sufficient cause of moral rule breaking and acts of crime"*
>
> (Wikström, 2010a, p. 226)

> *"Goals. This is probably the best starting point for situational analysis"*
>
> (Argyle, 1977, p. 364)

> *"Situational factors must be taken into account to understand people's motivations (and subsequent action in response to those motivations); different people may respond differently to the same motivator under the same circumstances, while the same person may respond differently to the same motivator under different circumstances"*
>
> (Treiber, 2017b, p. 58)

People breach moral rules and commit acts of crime for a range of reasons including greed, anger or boredom; unlike some other theories of crime, SAT states that there are there are no particular wants, desires, or needs, that motivate people to do so (Wikström, 2010b). Instead, "SAT defines motivation as goal-directed attention; people are motivated to obtain particular outcomes, and act in (preferred) ways they decide will obtain these outcomes" (Treiber, 2017b, p. 58).[1]

Motivation emerges from the person-setting interaction because it is created from opportunities and frictions present in the setting that must be perceived by the individual. In this way, perception is crucial to elicit motivation. For example, if opportunities connect with a person's desires, needs or commitments, then a person may experience temptation; if frictions evoke feelings of annoyance or anger in a person then that person may experience provocation (Wikström, 2006, 2010b). This means that for SAT, motivation is very relevant to action because it plays a crucial role in the process leading to it and has a general influence on the content of the perception choice process (i.e., what kinds of acts are perceived and considered). The presence of parents may influence the goal-directed attention (motivation) in two ways.

Firstly, the physical presence of parents has relevance for all those present in the setting and not just the children of those parents (section 6.1:). It is therefore possible that physical presence might have a dampening effect on any potential frictions or opportunities that might arise in the setting. For example, potential sources of friction among peers might be less likely to escalate to high levels of provocation in the presence of an adult. If the presence of peer A's parent (and therefore peer B's other guardian) makes peer B less likely to hit peer A (for reasons detailed throughout this chapter) then this means that the level of friction experienced by peer A is

[1] For further detailed discussion of motivation and the related key concepts of desires and beliefs, intention, consequences, commitments and interferences, see Wikström (2006) and Barton-Crosby (2017).

reduced and they themselves are less provoked to hit peer B. In this sense, the process is dynamic over time. The presence of parents and other guardians can reduce the likelihood and effect of opportunities and frictions in settings.

Secondly, the perception of an opportunity to satisfy a goal is situational, and therefore parental presence may alter the content and level of motivations. For the majority of parents who are not motivated towards their children becoming offenders, the kinds of goals that they are motivated to direct their children's attention towards are not likely to involve acts of crime.[2] The goal-directed parenting behaviours and attitudes of parents, and their own personal moral rules, are a feature of settings in which they are physically or psychologically present. Parental presence therefore has implications for temptations and provocations in two ways. Firstly, parental presence may alter the salience of particular desires and commitments; for example, a young person's attention might be directed to shopping for new clothes when in a shopping centre with their parents, but more directed to hanging around, pursuing entertainment and stealing items from a shop when in the presence of peers, particularly those who are shoplifting-focused. Secondly, affect can play a role in both directing and maintaining goal-directed attention (Treiber, 2013). Therefore, parental presence or absence may (positively or negatively) influence emotions, moods and visceral states which are implicated in motivation. Emotions like excitement or anger could sustain attention that is directed toward act of crime, but the presence of parents may serve to dampen that emotion. For example, a young person's anger in response to a friction might be dampened (i.e., the person is less provoked) in the presence of a parent who has a different, potentially lower, friction sensitivity.[3]

Although a person must be motivated to do an act of crime, further processes are needed for the crime to actually occur. For example, General Strain Theory (Agnew, 2006) suggests that people commit crime in response to negative emotions caused by strains and stressors, however, it is clear that these strains are present in many situations where crime does not occur. Instead, SAT asserts that although temptations or provocations can influence the general direction of moral action, crucially, whether motivations are acted upon is dependent on the perception of action alternatives and not motivation per se. In short, for SAT, motivation is a necessary but not

[2] Parents can have any goals for their children. The content of their parenting behaviours (including their influence on the target of their child's goal-directed attention) will reflect the content of these goals, though the parenting processes themselves can be the same. See further section 4.2.2.1:. This is not a problem for SAT because it is not a moralistic theory and does not assume the content of a 'conventional' moral values system or rely on the existence of moral convention.

[3] Emotions like anger result from the interaction between the friction sensitivity of the person and frictions present in the setting; see further, Barton-Crosby (2017). Until such complex and specific processes have been better theorised and empirically studied, the particular role of parental presence remains a little vague.

sufficient cause of moral action (Treiber, 2017b; Wikström, 2014). Motivation initiates a perception-choice process, of which perception is again a crucial component.

6.2.2: Perception

> *"there are individual differences in the perception of situations"*[4]
>
> (Magnusson & Endler, 1977a, p. 29)

> *"perception is what links individuals to the environment"*
>
> (Wikström, 2004, p. 6)

> *"the perception process… populates the field of alternatives from which a person will choose his/her action"*
>
> (Treiber, 2017a, p. 99)

SAT's two step perception-choice process begins with a person perceiving alternatives for action. Most people do not commit crime most of the time simply because crime is not among the action alternatives they perceive (Wikström, 2010a). SAT places the process of perception at the fore of (criminal) decision-making theory, which usually only focuses on the process of choice (see further, chapter 5 and also Treiber (2017b)).

People perceive the contexts they are acting in (action contexts) differently. Different individuals may pay attention to different aspects of a setting (selective perception) or perceive those aspects differently (distorted or biased perception) (Wikström & Treiber, 2018, in press). This differential perception is crucial for the behavioural outcome because it distinguishes action alternatives, and it is from among these that an actor can choose. The perception of action contexts is therefore not only crucial to elicit motivation; it also distinguishes action alternatives (Wikström, 2006). The process of perception is therefore fundamental to the process of choice because it furnishes choice with "a goal, content, and potentially conflict" (Treiber, 2017b, p. 57). The importance of this neglected first step becomes clear when we think of examples of behaviours that we need not restrict or inhibit ourselves from doing simply because that action alternative had not even occurred to us in the first place. As Treiber writes, "When was the last time you chose not to rape somebody?" (2017b, p. 58) (for other examples, see also, Wikström, 2010a).

The perception of action alternatives is shaped by the moral filter. The moral filter is the outcome of the interaction between the person's own morality, and the moral rules of the setting (for more on moral filtering of action alternatives, see, Brauer & Tittle, 2017; Messner, 2012; Wikström, 2010a). For SAT, morality is synonymous with rules of conduct, and therefore rule

[4] The authors use 'situation' here to refer to environment, see section 2.3:.

guidance resides in both the person and the setting. Parents are potentially able to influence both personal morality and the moral context of the setting in situational processes (see section 5.2: for how parents can also influence these via other processes).

Personal morality comprises a person's moral values (beliefs about the right or wrongness of actions) and moral emotions (i.e., shame and guilt, which represent the strength with which they hold those values). A setting is the objects, persons, and events in a social environment that an actor can access with his or her senses and a person's actions are only influenced by the settings in which they take part (Wikström, 2006). The moral context of a setting comprises the perceived moral rules and the perceived level of moral rule enforcement (deterrence). The strength of the moral context determines if a setting is criminogenic, for example, a setting characterised by incentives to offend (e.g., weak law-relevant moral norms and weak enforcement of the law) has a weak moral context and is therefore criminogenic because it encourages (or does not discourage) crime. (For discussion of action contexts in SAT see also section 5.3.1:).

Whether particular courses of action are eliminated from (or never included in) the perceived action alternatives, and how quickly this might occur, will depend on the strength of the moral rule (either of the person or setting) and how strongly it is enforced (either by deterrents in the setting or personal moral emotions such as shame and guilt). Moral emotions such as shame and guilt are potentially crucial to the moral filtering process because neurological evidence suggests that this filter may be intuitive in nature. This means that emotional input may spontaneously increase the salience of desirable action alternatives and purge undesirable ones; before cognitively costly deliberation need take place (for discussion, see, Treiber, 2013). This means that immediate (anticipatory) emotions influence the role morality plays in the perception of action alternatives.

Moral emotions such as shame and guilt develop alongside moral rules (for discussion and empirical study of these developmental processes, see, Wikström, 2005; and also section 5.2.1.2; Wikström & Treiber, 2018, in press; Wikström, Treiber, et al., Forthcoming). Shame is of particular interest in this study of situational processes because only shame varies situationally by those present in a setting.[5] This is because shame is a negative feeling experienced in the presence or consideration of others (whereas guilt refers to a negative feeling felt inwardly towards oneself). Since shame also varies 'in consideration' of others it is also relevant to the psychological presence of parents. Feelings of shame are strongest in front of parents, in comparison to teachers and peers. Trivedi-Bateman (2014) provides definition and empirical

[5] Shame is not empirically studied in this thesis, but is an important part of the theoretical argument presented.

study of moral emotions and crime within an SAT framework. Moral emotions play a dual role in the perception-choice process because affect can be both be anticipated and anticipatory (Treiber, 2013; Van Gelder, Elffers, Reynald, & Nagin, 2014). Anticipated shame (anticipation of the experience of negative feeling in the presence or consideration of others at some future time) can influence expected outcomes of action and is therefore implicated in the deliberative element of decision-making (see section 6.2.3.2:). The physical and psychological presence of parents and other supervisors can have a temporary strengthening effect on a person's morality via a process involving anticipatory shame.[6]

The anticipatory (immediate) influence of shame on action is neglected in research because it is implicated in differential motivation and non-deliberative decision-making processes (e.g., habitual behaviour), which are much less theorised and researched in criminology (Treiber, 2013; Wikström, 2010a; Wikström & Treiber, 2009b). Moral emotions such as shame determine the strength of overall morality by representing how much one cares about the particular moral rule to which the moral emotion is attached (Trivedi-Bateman, 2014; Wikström, 2009; Wikström & Treiber, 2009a). Although most elements of morality develop over time and are situationally stable, immediate feelings of shame experienced at the time of decision-making vary according to persons present. For example, in her study of moral emotions using Peterborough Adolescent and Young Adult Development Study (PADS+) data, Trivedi-Bateman (2014) found that participants reported that if peers, teachers and parents were to find out that they had committed various specific acts of crime, they would experience the highest levels of shame when experienced in the presence or consideration parents, and the lowest in front of peers.[7] In line with expectation (see section 4.3.2:), the level of shame participants expected they would experience in front of teachers (representing other guardians) was more than if in front of peers but less than if in front of parents. Therefore the physical or psychological presence of parents, or physical presence of other guardians can have some situational influence on a person's (otherwise relatively stable) overall morality. In the presence of parents and to a lesser extent other guardians, the level of anticipatory shame experienced is increased, strengthening overall morality to some degree and lessening the likelihood of crime being perceived as action

[6] Elements of the process described here are in line with Hirschi's (1969) social bonding theory, however, this theory is incomplete and imprecise (see chapter 5 for discussion).

[7] This is in agreement with Hirschi's (1969) findings (see also, Hirschi & Gottfredson, 2003). In contrast, a study by James Coleman (1961) is sometimes cited as an example of a study that found peer influence to be greater than parental influence, especially regarding 'disapproval' (e.g., Warr, 2002). However, Coleman's contemporary, David Epperson, advises caution in concluding that the influence of a peer 'subculture' is stronger than that of parents. He points out flaws in Coleman's methods and conclusions, and, of particular relevance here, suggests that attachment to family and the 'nature of the decision-making situation' should be taken into account when assessing the influence of a peer 'subculture' (Epperson, 1964).

alternative. For specifics on the neurological mechanisms by which emotions influence the action decision-making process in this way, see Treiber (2013).

The physical presence of adult guardians in settings also serves to strengthen the moral rules of the setting. Parents and teachers typically hold stronger law-relevant moral rules than, for example, the peers who may otherwise be present.[8] SAT states that a "measure of the strength of a moral rule that applies to a setting is the degree to which it is shared (…) by those taking part in the setting" (Wikström, 2010a). Therefore, the moral rules of a setting are predominantly likely to be more strongly law-relevant when adult guardians such as parents are present.

Since it is the perception of moral rules by adolescents that are important for the action process, the psychological presence of parents impacts on the perceived moral rules of settings just as if parents were physically present. However, the magnitude of the influence of the parents' moral rules may not be the same when they are present psychologically as physically. Warr (2002) uses the concept of psychological presence of parents to argue that the influences of absent parents and present peers in settings are involved in a 'parents versus peers' conflict.[9] However, Warr does not specify the processes involved in neither such conflict nor 'influence' on action. Settings do not present a 'united front' of moral rules. Conflicting moral rules in settings are not discussed in detail here, however, the presence of setting features and individuals with conflicting moral rules to parents (e.g., peers) may reduce the effect of the presence of parents on the perception of action alternatives, and this may be particularly the case when parents are only psychologically present.

Parental presence can influence the actual or perceived moral rules of settings and/or (temporarily) their child's morality. This means that such presence impacts upon the perception of alternative(s) for action by their children because this is a result of the interaction between personal morality and the perceived moral rules of the setting (the moral filter).

[8] Data from the Peterborough Adolescent and Young Adult Development Study (PADS+) on the moral rules held by young people is presented by Wikström et. al. (2012 p. 134-5), and these pages also detail this 16-item moral rules scale. PADS+ collected data from the young people's parents about the same moral rules (for information on the PADS+ parent interview, see Wikström et. al., 2012, p. 61-2). This data was analysed for the purposes of this footnote. Parents generally reported perceiving the 'wrongness' of every item of the moral rules scale more strongly than the young people at any age. While the young people reported a mean score of 36.3 at age 13, decreasing to 29.5 at age 17 (Wikström et. al., 2012, p. 135), the parents reported a significantly higher mean score of 43.4 (alpha = .79), reflecting their stronger moral rules.

[9] In addition, Laird, Criss, Pettit, Dodge, and Bates (2008) argue that perceived parental knowledge may protect adolescents against the impact of delinquent peers, but the mechanisms are not detailed.

6.2.3: Choice

> *"Perception occurs prior to deliberation, and prior to taking the situation to be one in which we need to deliberate. It is precisely because the situation is seen in a certain way that the agent takes it as one in which he feels moved to deliberate"*
>
> (Blum, 1994, p. 37)

> *"To adequately frame the process of choice requires taking upstream processes of motivation and perception into account, as the former determines the goal which an action choice aims to achieve, and the latter provides the set of possible action alternatives from which a choice is made."*
>
> (Treiber, 2017a, p. 102)

> *"acts of crime may… be committed out of habit (predetermined) or as a result of deliberation (voluntaristic)."*
>
> (Wikström & Treiber, 2009b, p. 411)

Making a choice about action is the second step of SAT's perception-choice process (see also, Blum, 1994). Unlike many other theories of decision-making, SAT does not conceive of the process of choice as a straightforward rational deliberation (e.g., weighing up of pros and cons). For SAT, the process of choice is either habitual (automatic/ intuitive) or deliberate (rational) (Treiber, 2011, 2017a; Wikström, 2010a; Wikström & Treiber, 2009b).[10] A model of decision-making that takes these dual processes into account provides a more comprehensive explanation of criminal decision-making than a traditional model of rational choice; and is also receiving empirical support (e.g., and see for other examples, Treiber, 2011, 2013).[11]

The content of the moral filter (i.e., the interaction between personal morality and the perceived moral rules of the setting) is crucial to the nature of the process of choice (i.e., whether it is habitual or deliberative). SAT's principle of moral correspondence states that if the perceived moral context of the setting and the momentary personal morality of the individual are aligned in terms of law relevance (i.e., they both encourage or both discourage crime), then crime will be either likely or unlikely respectively. When personal morality and the moral context are congruent, action will be habitual and therefore controls irrelevant (see Figure 6).[12]

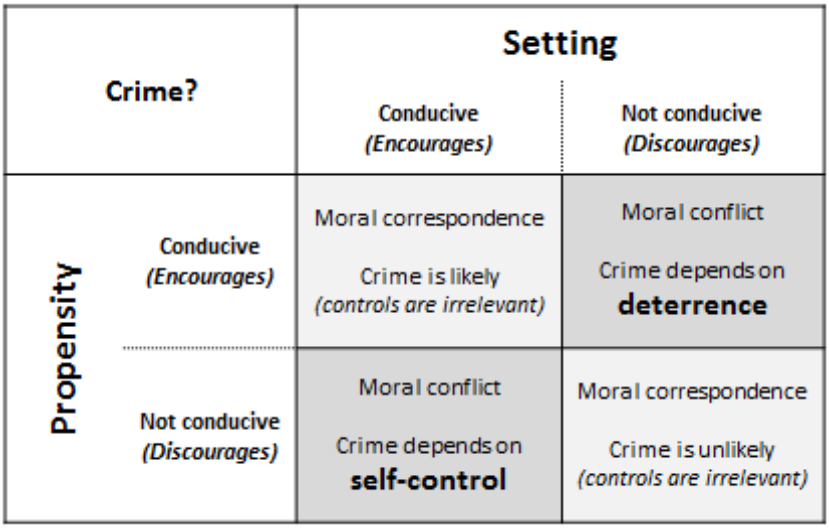
---

[10] Although SAT also acknowledges that in reality, elements of habit and deliberation are present in most action decisions.

[11] See also, outside of criminology, the model of frame selection (Esser, 2009; Esser & Kroneberg, 2015; Kroneberg, 2014).

[12] Reckless' (1950) 'prediction model for the two containments' may appear to have some similarities to the principle of moral correspondence because the model describes the circumstances under which different sources of controls (internal or external) are most relevant. However, as a control theorist, Reckless conflates rule guidance and control (see section 5.1.1.1:). This means that the effect of these (internal or external) controls on action is fundamental rather than conditional. This is a vitally crucial distinction between SAT and such control-focussed theories - one that is sometimes overlooked (e.g., Britt & Rocque, 2016).

Figure 6: Principles of moral correspondence and the conditional relevance of controls[13]



If there is conflict between the two sources of rule-guidance, and either personal morality or the moral context encourages (or does not discourage) crime, an act of crime will be perceived as an action alternative. Whether the process of choice is habitual or deliberate will depend on whether other alternatives are also perceived.[14] As described above, this perception of alternatives itself depends on interaction between personal moral rules and those of the setting. If no other (non-crime) action alternatives are perceived, an act of crime will occur, driven by habit.

If other (non-crime) action alternatives are perceived, only now does a deliberative process of choice become relevant to the action process. It is only at this point do internal and external controls become relevant to the action process via the management of conflicting rule guidance. Therefore, for SAT, controls only have conditional relevance (for a discussion and empirical evidence of the conditional relevance of controls, see, Hirtenlehner & Hardie, 2016). When personal morality encourages crime and the perceived moral context discourages crime, external controls present in the setting (deterrence) may deter crime. In the opposite case of conflicting rule guidance, when personal morality discourages crime and perceived moral context encourages crime, internal controls may deter crime. Internal controls refer to a person's ability to exercise self-control, which is the ability to "to act in accordance with his/her morality in the face of temptations and provocations" (Wikström, 2010b, p. 1004). (For more on SAT's conception of

[13] SAT's principles of moral correspondence and the conditional relevance of controls have been developed in publications since 2004 (see references in the main text). This figure draws upon these developments and a first depiction of these principles in Wikström (2010a, p. 233).

[14] As depicted in Figure 5, it is possible for individuals to not perceive crime as an action alternative in situations characterised by conflict between personal morality and the moral context. This is discussed in footnote 15 on page 192.

self control, see, Wikström & Treiber, 2007). The conditional relevance of controls is depicted in Figure 6.

6.2.3.1: Habit

> *"Habitual actions provide decision shortcuts, learned by experience, which facilitate most customary activities"*
>
> (Treiber, 2013, p. 195)

The principle of moral correspondence states that if there is correspondence between a person's morality and the perceived moral context of the setting, then the crime outcome depends on whether the consensus of those moral rules is towards or against rule-breaking. If both sources of rule guidance encourage crime, the only action alternatives perceived will be acts of crime and therefore the process of choice is habitual and the person will commit an act of crime. Alternatively, if a person's morality and the moral context discourage (or do not encourage) crime, an act of crime will not be among the perceived action alternatives, and in this case, crime will not occur.[15] The flow diagram in Figure 5 on page 183 depicts these potential alternatives.

If only one action alternative is perceived, there is no deliberation over alternatives and the behavioural outcome is habitual in nature (chosen automatically). This kind of more intuitive process is often ignored in the decision-making literature (Wikström & Treiber, 2009b). Habits are formed when an individual learns to choose a particular action in response to repeated exposure to a particular setting and circumstances because the outcome is predictable (and desirable). Habits are therefore shortcuts that save time and cognitive effort and are informed by experience. Since a person's activity fields are dominated by familiar routines, much action is habitual. When more than one action alternative is perceived, actors must choose which one to carry out. Habits are therefore broken when a person becomes aware of other alternatives and is therefore forced to deliberate in the choice process (Wikström, 2006).

The psychological or physical presence of parents can reduce habitual acts of crime. Parenting behaviours can influence the formation of habits over time, for example, by practising consistent responses to a child's behaviour. However, this thesis focuses on situational processes.

[15] Figure 5 depicts two eventualities whereby an individual does not perceive crime as an action alternative in situations characterised by conflict between personal morality and the moral context. Since habits are formed in response to repeated exposure to situations, this habitual response to moral conflict is possible in familiar settings in which individuals have repeated experience of a particular outcome. In such settings the moral conflict does not necessarily trigger deliberation if the experienced outcome does not reflect the moral conflict. For example, when personal morality encourages a particular action and the parents present in the moral context discourage that action (moral conflict), but past experience suggests to the individual that their parents will ignore or otherwise not respond to their actions, they may eventually just act habitually. I.e., moral conflict only has the effect of triggering the deliberative choice process if the moral conflict is perceived as such by the individual.

Specifically, habitual rule-breaking is disrupted if parents force children to see additional action alternatives. The psychological or physical presence of parents may reduce the likelihood of a habitual act of crime by increasing the likelihood of pro-crime moral correspondence or introducing moral conflict, via the situational impact of their presence on the morality of their child or the moral context of the setting (these various eventualities are depicted in Figure 5 on page 183). If the influence of the presence of parents in a setting means that either the moral context more strongly discourages crime, or the person's own morality temporarily discourages crime (or both) then habitual crime is less likely.[16] Either a strong moral context (due in part to strong crime-relevant morals of the parents who are present), or strong personal moral rules of the adolescent (including those that are temporarily strengthened via a process involving anticipatory shame) means that the perception of non-crime action alternatives is more likely, in which case habitual crime is ruled out. For example, a parent may send a text to or otherwise contact their child when the child is in a setting in which they habitually break rules. This example is relevant to parental presence because despite the familiar setting and circumstances, the text serves to remind the adolescent of their parent's knowledge and therefore make the parent psychologically present, or strengthen that psychological presence. Due to the process of perception, this change may result in a change in the perceived action alternatives which may force deliberation. Such changes may only be temporary but may still disrupt existing habits and even the formation of habits. For example, parents might only need to be occasionally and periodically physically present in familiar settings to disrupt the formation of habits. In this sense, the effect of parental presence in a setting might have an effect on the action outcome of the interaction between the child and that setting beyond the period of presence. Situationally, this means it may be relevant whether a parent has ever or recently been present in that setting.

6.2.3.2: Deliberation

Deliberation is particularly useful in uncertain or unfamiliar circumstances where outcomes, contingencies, preferences and intervening factors may be less well known (Treiber, 2011, 2017a; Wikström, 2010a; Wikström & Treiber, 2007). This deliberation is a more rational process of choice, but it is also very much guided by preference and emotion. Affect indicates the relative significance of inputs that inform the action decision (e.g., consequences) (Treiber, 2013). This deliberative process assesses information that is of most significance to the actor and the action

[16] It is also possible within the framework of SAT for parents to increase the likelihood of habitual crime by the same process described here. However, across a population, this is less likely to be the direction of influence due to parents being more likely to be focused on non-offending outcomes for their children and having stronger moral rules themselves (section 4.2.2.1:)

in the particular circumstance and allows the actor to choose the action alternative that appears best to him/her. SAT states that what is regarded as the best option by an actor is:

> *"not primarily a question of self-interest (personal advantage) but largely an assessment of what is a morally acceptable way to satisfy a desire, honour a commitment or respond to a provocation"*
>
> (Wikström, 2014, p. 18).

For SAT, control is particularly relevant to this process of deliberation.

> *"Control is conceptualized in SAT as the process by which a person manages conflicting rule-guidance in his or her choice of action in relation to a particular motivation. What controls thus aim to control is the adherence to moral rules when a person deliberates about alternatives for acting upon a motivation"*
>
> (Wikström, Oberwittler, et al., 2012, p. 25)

Thus, it is only when moral rule guidance is in conflict that controls become relevant. Specifically, deterrence (external control) becomes relevant when personal morality encourages crime but the moral context discourages crime, and self-control (internal control) becomes relevant when personal morality discourages crime but the moral context encourages crime (see Figure 6 on page 191).

The main way that the presence of parents can influence the process of deliberation is by having impact on the process of controls.

When parents are present, if their influence on the perception of the rules of the setting is strong enough then it is most likely that any rule conflict stems from a context that discourages crime while the adolescent's own personal moral rules encourage crime (and hence, parental influence on external controls are most relevant for action). The alternative is less likely. Parents in general strengthen the moral context of settings, so it is less likely that, in the presence of parents, the moral context of the setting is weak (and has not been sufficiently strengthened by the presence of parents) yet also the adolescent has strong personal crime-relevant morality (even temporarily). This means that the relevance of internal controls for rule conflict management is less likely in the presence of parents than, for example, in the presence of peers. Further, a direct role for parents in the situational ability of adolescents to exercise self control is quite limited.[17] By contrast, the presence of parents can have a big impact on external controls in settings and adolescent perceptions of these. This potential impact is reflected in the preoccupation with

[17] While substance use and extreme emotion (for example) may hinder an individual's ability to exercise self control in particular circumstances (Wikström & Treiber, 2007); a role for parents in this process is indirect.

external controls (deterrence) of a large proportion of the literature on supervision (section 5.3.1.1:).

Controls in the form of deterrence are relevant to the process of deliberation in cases of rule conflict where the setting rules discourage crime. For SAT, deterrence represents concern or fear of consequences and it is determined by the perceived risk of intervention (certainty) and the associated perceived risk of punishment (severity) (Wikström, 2008). Therefore, as with other deterrent features of settings, the efficacy of the deterrent effect of physical and psychological parental presence is determined by the perceived likelihood of detection and perceived potential and strength of any resultant sanctions.[18]

Physical and psychological parental presence increases the likelihood of detection. The salience of both physical and psychological parental presence is crucial for perceptions of detection likelihood; therefore parental presence is relevant to the moral context in terms of controls as well as morality. When a parent is physically present, detection (by the parents at least) is much more likely. Even when a young person is unsupervised, their perception that their parents know where they are, what they are doing or who they are with adds a deterrent quality to a setting. For example, a parent who is knowledgeable about the circumstances of action may easily also become aware of an act of crime, either via the same process they gained the parental knowledge, or by virtue of that parental knowledge. The likelihood or certainty of punishment is usually found to have a stronger deterrent effect than the severity of the sanction (for a discussion, see, e.g., Hirtenlehner & Hardie, 2016; Von Hirsch, Bottoms, Burney, & Wikström, 1999). However, punishment severity is still relevant to whether a person is concerned or fearful about the consequences of their action (and therefore deterred from carrying it out) because even if detection was certain, a very mild punishment would surely hold little deterrent effect (Hirtenlehner & Hardie, 2016). Control theorists agree that in terms of informal social control, parents are crucial (see section 5.1.1.1:). Therefore, as their presence makes detection by them more likely, then the level of severity of sanctions also becomes relevant. Parents in particular are a primary agent of control in most adolescent's lives. As gatekeepers of resources (e.g., money, transport) and regulators of future discretionary time use (e.g., via curfew), parents often command effective deterrents against rule-breaking, but as the significant others of adolescents, parents can also play a deterrent role in settings via a process involving anticipated shame.

[18] Individual differences are again crucial as it is the *perceived* likelihood and *perceived* strength of sanctions that are of importance to the choice process. The actual likelihood and strength of the sanctions may be perceived differently by different individuals. This differential perception can be influenced by a range of factors that will not be discussed further here (including parent-child bonds, parenting style and efficacy or consistency, and level of responsibility of the guardian).

Physical and psychological parental presence can influence anticipated shame, which can act as a deterrent in the deliberation process. Anticipated shame is the anticipation of future experience of negative feeling in the presence or consideration of others. As such, it varies situationally by who is present (or virtually present), and is stronger in the presence or consideration of parents than peers (with teachers somewhere in-between). Anticipated shame (as opposed to the more immediate effects of anticipatory shame, see section 6.2.2:) can influence expected outcomes of action, and is therefore implicated in the deliberative element of decision-making. This is one proposed mechanism by which external controls (deterrents) operate. The physical and psychological presence of parents means that actors are more likely to be aware that their parents would/ could know or find out about his or her actions in a setting. Anticipation of parents knowing or finding out about an act of crime serves to increase the level of anticipated shame. Anticipated shame is therefore a negative consequence of an act of crime. This means that anticipated shame qualifies as having a deterrent effect in line with SAT's conception of deterrence outlined above (Wikström, 2008).

The presence of adult guardians in settings also generally increases the level of enforcement of the moral rules of the setting because adult guardians are generally responsible for enforcing rules when in a supervisory role, and in most cases are more motivated to do so. Adult guardians, particularly parents, want to ensure that the young person does not become involved in, for example, crime. This means that parents and other guardians are motivated to enforce law-relevant moral rules in a way that others (i.e., non-supervisors such as peers) are not.

6.2.3.3: Summary: the conditional relevance of controls

This discussion of the role of the physical and psychological presence of parents in action decision-making echoes many themes and ideas that are present in discussions of the effects of direct control, deterrence, social bonding, and the presence of handlers and people with differing degrees of responsibility. This literature is critically discussed in chapter 5. In contrast to this literature, the deterrent role of parental presence in action decision-making is only one part of the action process within SAT. The situational role of the psychological presence of parents and physical presence of parents and other guardians in settings is not limited to deterrence, and the deterrent role is conditional. The role of deterrence is not conflated with processes that explain why the adolescents or the settings came to be as they are, or explain the pattern of exposure of adolescents to settings. SAT cannot be categorised as a control theory as suggested by Britt and Rocque (2016).

For control theories, controls provide 'costs' (in the form of consequences) to counterbalance the assumed 'benefits' of crime, and the function of rules is to limit natural behaviours (e.g., Hirschi & Gottfredson, 2003). This assumes that individuals decide how to act based on a cost-benefit calculation, which is a problematic assumption in the light of habitual action. By contrast, the role of perception is more fundamental in SAT (Treiber, 2017b). As Wikström (2008) argues, most of the time individuals do not perceive acts of crime as among their action alternatives and therefore rarely have need to consider the risk and severity of punishment when acting. For SAT, rules guide action and inform and facilitate as well as inhibiting; and controls are "the process by which a person manages conflicting rule-guidance" (Wikström, Oberwittler, et al., 2012, p. 25).

6.3: Summary

To effectively prevent crime we must explain how and why acts of crime happen (chapter 1). To explain we must discover causes, but crucially also the mechanism (process) by which the causes make the effect happen (Wikström, 2011, 2017). These processes are often unobservable (Bunge, 2006) which means that hypotheses represent what we would expect to see happening in the data if the proposed process was taking place as hypothesised.

Theories must be empirically tested and either falsified or supported in order to advance knowledge (Popper, 1963). Therefore, theory must provide specific and testable hypotheses. Clear, explicit definition of concepts, expected relationships and mechanisms are crucial to this process because a lack of specificity means a lack of testability. Without clear definitions of concepts and mechanisms, empirical tests cannot be specific and results are therefore inconclusive about causes. SAT has been developed to be testable, and therefore provides clear definitions of key concepts and specific models of how they interrelate to explain crime (Wikström & Treiber, 2016a). Many relevant concepts have been defined throughout this thesis so far; in particular, chapter 4 provides clear definitions of what is meant by the parental monitoring concepts used in this thesis, and how they relate to each other. This chapter detailed plausible mechanisms to explain the commonly demonstrated and consistently strong association between specific parenting variables (parental presence, presence of proxy parents such as other guardians, and the adolescent perception of parental knowledge of the circumstances of activity) and adolescent crime, specifically, the role these have in situational (as opposed to developmental) processes. These are summarised in section 6.3.1:.

The final section of this chapter (section 6.3.2:) describes selected hypotheses and expectations that arise from these proposed mechanisms for empirical testing in Part IV. Capturing the

situational elements of SAT's situational model of action (i.e., motivation, perception, and choice) independently is very difficult and perhaps even impossible because the processes involved are particularly unobservable (Wikström, Oberwittler, et al., 2012, p. 365).[19] Although hypotheses must be testable in principle they often may not be directly empirically tested; it is evidence that corresponds to proposed mechanisms and processes that is important for accepting or rejecting hypotheses (see also, Popper (1963)). This means that the hypotheses that arise from the mechanisms proposed in this chapter do not necessarily embody the detail of the mechanisms but are consistent with them. For example, whether the effect of the studied variables on the behavioural outcome is via an effect involving the process of perception or involving the process of choice, or via its effect on the moral rules or its effect on their enforcement, is not distinctly hypothesised in this study since it is not possible to empirically differentiate these processes and effects, at least, even with the already specialised data available. For example, it is not possible to apportion any reduction in the crime outcome to either a strengthening effect of the presence of parents on moral rules of the setting or the perception of parental knowledge cueing the effect of deterrent properties of increased sanction likelihood on the choice process. The results of empirical tests of these hypotheses therefore may not always be able to fully confirm or refute particular proposed mechanisms, but may provide evidence that is consistent with expectations based on the mechanisms and has coherent and relevant implications for crime prevention policy and practice.

6.3.1: Summary of mechanisms

The presence of parents and other guardians and perceived parental knowledge of the circumstances of activity were selected for study because their consistent association with lower rates of crime is rarely explained by theoretical discussion or empirical tests of plausible mechanisms. They are also poorly described and defined. This means that although these factors are not necessarily the most theoretically or empirically impactful factors on crime, nor are they the only relevant parenting or parental monitoring factors; it is important to clarify how, when, for whom and why the presence of guardians and perceived parental knowledge do and do not influence crime.

Both the physical presence of adult guardians in settings, and the psychological presence of parents in settings (as captured in part by a measure of perceived parental knowledge, see section

[19] Some methods such as randomised scenarios go some way in pursuit of data that can test hypotheses raised by the perception choice process (e.g., Eifler, 2016; Pauwels, 2018, in press; Wikström, Oberwittler, et al., 2012, pp. 364-402); though these are not without problem, for example, the validity of a measure of perception (such as that captured by Eifler (2016)) is questionable.

6.1:) serves to strengthen the moral context via the reduction of motivations to offend, and the strengthening of both moral rules and their enforcement. When parents or guardians are physically or psychologically present, the likelihood of an act of crime is reduced due to the impact of the reduced criminogeneity of the context on the situational processes of motivation, perception and choice which lead to action.

Specifically, the physical presence of parents and other guardians in settings, and the psychological presence of parents in the absence of any guardians i) reduce opportunities and frictions, and focus attention on non-crime goals; ii) hold stable or decrease the likelihood of crime being perceived as an action alternative and increase the likelihood of other, non-crime action alternatives being perceived (instead of, or as well as, acts of crime); and iii) if an act of crime is perceived as an action alternative but is not carried out habitually, then the physical and psychological presence of guardians serve to increase levels of anticipated shame and deterrence, leading to a reduced likelihood that an act of crime is chosen from among the action alternatives.

The physical and psychological presence of parents and guardians thus reduces the criminogeneity of settings because "settings are criminogenic to the extent that their perceived moral norms and enforcement discourage (or do not discourage) acts of crime in response to the opportunities they present and/or the frictions they create" (Wikström & Treiber, 2018, in press).

In comparison to mechanisms that are proposed as a result of the application of other theoretical approaches (see chapter 5), framing this study within SAT means that i) these proposed mechanisms distinguish the situational process from processes of emergence or selection, ii) there is a role for rule guided behaviour and habitual action, and iii) the relevance of controls is conditional. Ultimately, SAT elevates the role of differential perception of the moral context (including features such as parental monitoring) to crucial for the action process. By so doing, the situational process proposed by SAT provides a role for features of settings (such as the physical and psychological presence of parents and guardians) in mechanisms that link individuals to their settings in the process that leads to action (including acts of crime).

6.3.2: Selected hypotheses

Not all the aspects of a complex multi-faceted theory like SAT that are summarised in chapter 5 can be tested easily at one time. This thesis aims to test hypotheses derived from SAT that relate to situational mechanisms linking the presence of parents and other guardians, and perceived parental knowledge of the circumstances of activity, with acts of crime. These hypotheses are

derived from the application and expansion of SAT's situational model in section 6.2: of this chapter, against a background of the discussion of the concepts of parental monitoring, supervision, the presence of guardians and perceived parental knowledge in chapter 4.

In order for the findings to have relevance within a comprehensive explanation of crime causation, the hypotheses tested in this thesis must distinguish the effect of the conditions under study on situational processes from their effect on other parts of SAT's explanation of crime. There is a considerable role for the presence of parents and other guardians, and perceived parental knowledge of the circumstances of activity in the processes of emergence and selection described in SAT's social model (section 5.2:), but the hypotheses being tested in this thesis must allow for the identification of situational effects. Demonstrating and describing the role of guardian status and perceived parental knowledge in social processes is not crucial to this investigation; however, the effects of these processes are referenced throughout the empirical chapters because situational processes are expected to have an effect on crime outcomes irrespective of the effects of processes of selection and emergence.

First, it is plausible that the presence of guardians and perceived parental knowledge are somehow implicated in the development of individual crime propensity or are related to other factors crucial to that process of emergence (see section 5.2.1.2:). This means that positive relationships between individual level crime propensity and both perceived poor parental knowledge and amount of time individuals spent unsupervised are likely (for findings see section 9.1.1:).[20] However, to demonstrate that they may play an additional role in situational processes, it is important that both parenting factors have relevance for crime outcomes at the event level, even when the effect of propensity (i.e., the individual level outcome of processes of development and change that is relevant to crime) is taken into account.[21]

[20] The theoretical developments of this thesis provide no specific expectation as to the individual-level relationship between the amount of time spent unsupervised and perceived poor parental knowledge; however, a positive relationship is likely due to the interrelationship of family variables and parenting practices (see further, section 9.1.1:)

[21] Simons, Simons, Chen, Brody, and Lin (2007) found that a measure approximating personal crime propensity fully mediated the effect of parental knowledge on crime and other rule-breaking behavioural outcomes at the individual level. Whilst this evidences a role for parental knowledge in the process of personal emergence, it should not necessarily be interpreted as evidence of the lack of a role for parental knowledge in situational processes. First, different measures of parental knowledge are likely to play different roles in these different processes (section 4.3.3.1:), for example, the adolescent perception of parental knowledge is relevant to the situational process (in relation to the concept of psychological presence, see section 6.1:). Second, parental knowledge may only retain its relationship with crime in interaction with propensity and the study by Simons et al. (2007) does not assess the interaction of these variables. Third, this study does not test situational processes using situational data and therefore the evidence cannot be used to conclude regarding situational processes (see further chapter 7).

Second, selection processes described in section 5.2.2: are likely to be manifest in the unequal distribution of propensity, perceived parental knowledge and guardian status across both situations (i.e., conditions of person-environment convergences vary) and individuals (who vary in their characteristics and exposure). This will result in the unequal distribution of individuals or situations to groups when categorisation is based on the combination of particular individual-level variables or situation-level conditions respectively (for findings see section 9.1.2: and parts of sections 10.1.1:, 10.2.2:, and 10.2.3:). Although the effects of selection processes (i.e., the creation of some small groups) may cause methodological difficulty for analysis, conclusions about situational processes should be relevant regardless of the relative population of those groups (thus effectively controlling for the processes of selection and emergence).

A number of testable hypotheses can be derived from the theoretical discussion of the situational process in section 6.2:. Although these do not directly hypothesise the detail of the unobservable mechanisms proposed, tests of them will provide evidence that is either in line with or counter to what we would expect if the proposed processes were taking place. An initial hypothesis relates to individual criminality and states that the likelihood of crime in a setting is positively related to the crime propensity brought to that setting by the actor (for findings, see section 10.2.1:)[22]. This hypothesis is not of direct interest to this thesis because it does not take account of features of settings and is therefore not specific to the topic of the situational role of parental monitoring.

The hypotheses of interest in this thesis are detailed in Table 4, which also lists the location of the relevant empirical tests in chapter 10.[23] These hypotheses can be divided into two groups. Ultimately, all hypotheses build to a final situational hypothesis that, if confirmed, renders the status of the others moot.

The first group of hypotheses in Table 4 refer to setting criminogeneity. Testing these will describe any consistencies in setting effects on acts of crime. Due to proposed effects of the physical and psychological presence of parents and other guardians in settings, the culmination of criminogeneity hypotheses in Table 4 suggest that *the physical presence of guardians (parents in particular) reduces the likelihood of acts of crime in settings, and, in the absence of any guardians, the psychological presence of parents also does so*. Only the first setting criminogeneity hypothesis (hypothesis 1.1) has been addressed in prior empirical research at the event level.[24]

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[22] For the individual level relationship between crime propensity and crime, see section 9.1.3:.

[23] These hypotheses about event level effects are also partially tested at the individual level in chapter 9; for details see footnote 27.

[24] Although not a direct test of this hypothesis, the commonly demonstrated (individual-level) positive association between unsupervised time use and rate of crime (section 3.3:) is in accordance with this hypothesis. However, a

Table 4: Hypotheses

Section tested	Setting criminogeneity hypotheses		Section tested	Situational hypotheses	
	1.1	The physical presence of guardians in settings reduces the likelihood of an act of crime in that setting…		2.1	
10.1.2:	1.1a	…and the magnitude of this reduction is larger for the physical presence of parents than other guardians.	10.2.2:	2.1a	All setting criminogeneity effects are conditional on crime propensity such that hours characterised by low crime propensity are least susceptible to the physical absence of parents (and, to a lesser extent) other guardians or, when unsupervised, the psychological absence of parents.
10.1.3:	1.2	Adolescent perception of their parents' knowledge of the circumstances (what, where and with whom) of their unsupervised activity reduces the likelihood of them committing an act of crime…	10.2.3:	2.2	
10.1.4:	1.2a	…and this reduction is most apparent when adolescents are unsupervised (and least apparent when they are being supervised by parents).	10.2.4:	2.2a	

Unsurprisingly for an empirical study that aims to test the situational model of SAT, the remainder of the hypotheses are 'all about interactions'.[25] This second group of hypotheses are identical to the hypotheses about setting criminogeneity with the addition that the setting effects are conditional on the characteristics of the individual actor. This makes them situational hypotheses. Tests of these situational hypotheses refer to the interaction of an individual (and their features) with a setting (and its features), and therefore will describe any extent to which settings have specific effects for specific individuals. A small number of prior studies have

small number of existing studies that collect detailed event-level time use data are additionally able to show that the increased rate of crime is only manifest during time when adolescents are actually unsupervised (and not just for those individuals who are often unsupervised) (Bernasco, Ruiter, et al., 2013; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012). (Averdijk and Bernasco (2014) also find a similar result for violent crime victimisation). For discussion of the distinction between individual level and event level analyses see chapter 7.

[25] The concluding chapter of the first monograph to extensively test various aspects of SAT is entitled "It's all about interactions" (Wikström, Oberwittler, et al., 2012, pp. 405-410).

produced findings relevant to hypothesis 2.1.[26] However, these studies include analysis of variables that capture the criminogeneity of settings and are not primarily studies of parental monitoring. As such, the measure of supervision is not always distinguished from other elements of criminogenic settings or sub-divided by supervisor (i.e., parents and others) (hypothesis 2.1a), and they do not assess additional parental monitoring-related factors such as perceived parental knowledge (hypotheses 2.2 and 2.2a).

Findings from tests of situational hypotheses have the potential to somewhat undermine the relevance for prevention of conclusions drawn about setting criminogeneity because i) any demonstrated effects of setting criminogeneity are differentially impactful and may in fact be ineffectual in some situations or for some people, and ii) some criminogenic effects might only be apparent in some situations or for some people and therefore might not be demonstrated in tests of criminogeneity on all situations or all people.

Within an analytical framework focussing on situational mechanisms, this thesis aims to test the conditional relevance of a lack of particular aspects of parental monitoring for a situational explanation of acts of crime. Crucially, any influence of the absence of parents or guardians or the perception of a lack of parental knowledge about unsupervised activities is not expected to be apparent (or equally apparent) in all situations (for all people in all circumstances). We would expect that *crime is most likely in situations under convergent conditions of high crime propensity, the absence of guardians, and a perception of poor parental knowledge* (culmination of all hypotheses in Table 4).

In order to test these situational event-level hypotheses, the very specifically defined concepts must be measured, and the resultant data must be analysed for evidence of the closely specified processes and interactions. The situational-level analyses capable of addressing these situational hypotheses are carried out in chapter 10. This endeavour requires a specialist approach to analysis and data collection, which is the subject of Part III.[27]

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[26] Only three studies of PADS+ data by Wikström and colleagues attempt to and succeed in demonstrating that the event level finding that crime rates are higher when actors are unsupervised (i.e., hypothesis 1.1) crucially only holds for people with particular characteristics. These studies provide an empirical test of hypothesis 2.1 and find that a lack of supervision is an important element of criminogenic contexts, yet people are differentially vulnerable to environmental inducements to offend depending on their individual crime propensity (Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012). (Beier (2017) also uses PADS+ STB data but to study alcohol consumption. He also finds evidence of interaction between setting criminogeneity (including supervision) and individual crime propensity in the explanation of action).

[27] Without this specialist approach and data the nature of these hypotheses is necessarily altered. The nuances of these differences are discussed in chapter 7 and, where possible, are applied in chapter 9 to assessment of the hypotheses presented in Table 4. Ultimately, in chapter 9 the analysis of situational interaction required by these hypotheses is addressed at the individual level via assessment of two-way statistical interaction (hypotheses 1.2a, 2.1, 2.1a and 2.2; sections 9.2.1: and 9.2.3:) and three-way statistical interaction (hypothesis 2.2a; sections 9.2.2: and 9.2.3:): *((PPPK x UNSUP) x Prop) → Crime*.

PART III: METHOD:

Capturing and analysing situational interaction

7 Analysing situational interaction

The rationale for the analytical approach of this thesis is rooted in the concepts of interaction and situation detailed in parts I and II. This chapter details the implications of these concepts for the specifics of the analytical approach, and resultant data requirements.

According to SAT, a situation is "neither the person (his or her traits and state) nor the immediate environment (its characteristics and state) but the motivations and perception of action alternatives that arise from their particular combination" (Wikström & Treiber, 2016a) and actions, such as crimes, result (see also, Wikström, 2006). This means that person-environment interaction is the cornerstone of SAT's explanation of crime (sections 2.3:, 5.3: and chapter 6). This particular kind of interaction may be called situational interaction. Evidence of situational interaction is evidence in support of a proposed causal process. Tests of situational hypotheses that arise from SAT's situational model of action (see, e.g., section 6.3.2:) require an interactive approach that is concerned with convergence. This interactive approach is very different to the classical (additive) approach which is concerned with the relative contribution of independent elements to an outcome. Even when applied to the study of interaction, this additive approach evidences a statistical dependency effect which cannot be causal.

The two empirical chapters of this thesis assess dependence (chapter 9) and convergence (chapter 10). The distinction between dependence and convergence, and the different methods and data required to study them is rarely acknowledged. This has resulted in a lack of clarity in the literature. The purpose of this current chapter is to outline and distinguish these approaches, and also their data requirements, various techniques, and contribution to the study of situational action. Section 7.1: introduces the key distinctions between the additive and interactive approaches to data collection and analysis which, when applied to the study of situational interaction, evidence dependency and convergence respectively. The traditional approach to the study of statistical interaction (dependency) between individuals and their exposure to environments is described in section 7.2:. Section 7.3: first outlines the approach of existing studies that analyse situational data and discusses whether they can and do evidence convergence, and goes on to introduce the specific techniques used in this thesis to study convergence and evidence situational interaction.

7.1: Additive dependence and interactive convergence

> *"Researchers who look for interactions between higher-order mental processes and environment will seldom use the same research approach as those who look for nothing more complex than covert mediators"*
>
> (Overton & Reese, 1973, p. 80)

> *"The treatment of XZ as a causal variable is misguided, because XZ has no causal potency in its own right. Rather, XZ is merely a mathematical device that captures the extent to which the effect of X on Y varies across level of Z (or, equivalently, whether the effect of Z on Y varies across levels of X). It is X and Z, the variables that constitute XZ, that are capable of influencing Y in a causal sense. The product XZ does not represent some unique entity that exists separately from X and Z, and therefore it cannot exert an effect on Y beyond that generated by X and Z."*
>
> (Edwards, 2009, p. 157)

> *"At the point that strong interactions appear, these traditional analytic procedures break down and different types of questions are asked"*
>
> (Overton, 1973, p. 87).

The history of the study of individual-environment interaction in the social sciences reveals different conceptions of the term 'interaction' (described in section 2.3.2:). One meaning of 'interaction' is *situational interaction* as described by SAT, which refers to the convergence and inseparability of individual and environment (e.g., Lewin, 1936). Another meaning of 'interaction' is interaction as assessed in regression models by the relative magnitude of the statistical interaction between features of individuals and their environments in comparison to that of the component parts (see, Ekehammar, 1974). This kind of interaction can be described as dependent interaction or *statistical interaction*. These two conceptions of 'interaction' are incompatible due to the incompatible worldviews on which they are based (see also, section 1.2.1.1:; Olweus (1977) and Overton and Reese (1973)). These incompatible worldviews have differing implications for studying interaction, in terms of both the analytical methods employed and the structure of the data that is required.

The interactive worldview encompasses the perspectives taken by analytical criminology, SAT, and this thesis. It determines that the questions of *how* individuals and environments interact and *how* and *why* this interaction is relevant to behavioural outcomes (such as acts of crime) are of most relevance to both research into the causes of action and attempts to alter behaviour (i.e., reduce crime). This approach emphasises situational interaction and causality (see further, Part I). The interactive worldview demands an interactive approach to the collection and analysis of data for the purposes of studying situational interaction.

By contrast, analysis of independent components is the central requirement of the additive paradigm. The statistical models that were developed within the additive paradigm therefore understand events as linear functions of independent elements (i.e., regression). When applied to the study of person-environment interaction, such regression methods[1] assess the relative size or contribution of the statistical interaction variance in comparison to that of the component parts (for examples of such methods, see section 7.2:).

Additive methods are not fully appropriate for the study of situational interaction. Statistical interaction implies only unidirectional causality and linearity, and captures only a statistical dependency between individual and environmental factors rather than a causal interaction effect (Edwards, 2009; Haar & Wikström, 2010). In this sense, statistical interaction isn't causal and "cannot be taken as support for an interactionist position" (Olweus, 1977, p. 228; see also, Overton & Reese, 1973, p. 78), because it is unable to answer 'why' questions (Ekehammar, 1974; Magnusson & Endler, 1977a; Mischel, 1973; Olweus, 1977; Overton, 1973; Overton & Reese, 1973).

Instead, the study of situational interaction needs a truly interactive paradigm that does not deconstruct situations into components parts. This kind of interactive approach requires different types of questions and different types of explanations (Overton and Reese 1973). Back in the 1970's when interactional psychology research had put the study of personality 'at the crossroads' ((Magnusson & Endler, 1977b); see also section 2.3.2:), the methodological implications of a truly interactive approach were not well investigated (e.g., Magnusson & Endler, 1977a; Olweus, 1977; Raush, 1977). Ekehammar (1974) stated more than 40 years ago that "the interactionist view has not flowered until now, partly because of the inaptness of earlier methodological tools" (p. 1027); yet arguably, this is still largely the case. Those working within the field of interactional psychology did not fully develop their arguments to explicitly consider the specifics of why these methods were inappropriate for studying person-environment interaction, and hence did not progress far with developing a new approach to studying such interaction.[2] As a result, in most studies of person-environment interaction, including most of those in criminology, empirical methods for demonstrating statistical interaction have been inappropriately applied to the study of situational interaction.

[1] Including analysis of variance (ANOVA) methods that were commonly used in the field of interactional psychology in the 1960's and 1970's.
[2] Though Mischel (2004) did later explicitly acknowledge the need for "in vivo behaviour observations to trace the individual's behaviour across multiple situations and over time" (Mischel, 2004, pp. 6-7).

It is not only the application of an inappropriate statistical method that can limit the analysis of person-environment interaction, but also the structure of the data being analysed. A worldview determines the nature of the approach to the entire research process (see section 1.2.1.1). The irreconcilable differences between the additive and interactive approach means that the kind of data that the additive approach directs researchers to collect is not suitable for evidencing situational interaction (as required by the interactive approach), particularly when using additive analytical methods (i.e., regression). To truly assess situational interaction, the individual and environmental data being analysed cannot be independent, rather, it must be linked in time and space (see also, Wikström, Mann, et al., 2018, in press; Wikström & Treiber, 2016a; Wikström, Treiber, & Hardie, 2012). Analysis of situational interaction needs situational data that captures the convergence of people *in* environments, and not just a dependency between people *and* environments.

In order to be able to study people in environments, the data about the person and the data about the environment must be spatially and temporally linked – i.e., the data captures which person (with particular features) is in which environment (with particular features) at a particular time.[3] Situational data captures crucial exposure measures in a different way to traditional data. While individual-level analyses might require data that, for example, captures a total amount of a particular kind of exposure an individual experienced over a certain time period or geographical area; situational data records whether or not a particular person was exposed at various specific (possibly continuous) points in time and space. Situational data is therefore structured differently such that each data point refers to the situation (the convergence of particular personal and setting characteristics). By contrast, individual-level data is structured so that each case reflects information captured about a particular individual and similarly, the structure of environmental-level data is at the area level. For situational data, the capture of spatio-temporally linked convergence of particular characteristics of individuals with particular characteristics of settings means that the unit of analysis is the situation. Early interactionist psychologists in fact argued that individual-environment interactions (and not individuals, as had become popular) should form the unit of analysis for psychology (Kantor, 1924; H. A. Murray, 1938).

> *"the organism and its milieu must be considered together, a single creature-environment interaction being a convenient short unit for psychology"*
>
> (H. A. Murray, 1938, pp. 39-40)

[3] This includes data that (spatio-temporally) links individuals to hypothetical or virtual settings such as randomised scenario response data or virtual reality behavioural data.

By focusing on situations rather than individuals, situational data captures the specific convergent conditions at the time of an act of crime and also at other times. Analysis of such data can allow specific statements about the conditions under which crime is more or less likely (i.e., the criminogenic convergence of, for example, high crime propensity and weak moral context and the characteristics of non-criminogenic convergence of conditions) and thus evidence causal situational interaction.[4]

There are very few studies that collect situational data in criminology (see section 7.3:). This is for two reasons, one practical, and one ideological. Firstly, collecting truly situational data about real world interactions and behavioural outcomes is costly and complex.[5] By nature, situational data is usually voluminous, very complex in structure, covers a broad range of variables, and requires innovative data collection methods and instruments. It is also often very time consuming and costly to collect and use because it requires highly trained specialist staff and involves very intensive data collection, processing and analysis (see also, Mischel, 2004; Wikström, Treiber, et al., 2012). For description of the situational data collection methods used by this study, see section 8.2.2:. Secondly, faced with the practical difficulties of collecting situational data, researchers must be motivated by the unique benefits of this kind of data, which requires a particular approach and set of research questions. The benefits of situational data are often undervalued or misunderstood (particularly by those whose methodological and analytical priorities are guided by an additive worldview) (see also section 8.2.2.1:). Criminology is not alone in its dearth of situational data. The interactional psychologist Mischel even suggests the same reasons for why studies of systematic person-invariance (i.e., studies of person-environment interaction) were 'slow to be done' in psychology: "They call both for a change in the core assumptions that traditionally guided the search, and, at the empirical level, for a massive data archive of in vivo behaviour observations to trace the individual's behaviour across multiple situations and over time" (Mischel, 2004, pp. 6-7).

Whether a study of situational interaction analyses situational data or not is a major factor in determining whether that study can or does evidence dependence, or convergence. The other factor is the analytical methods. Together these determine the approach to the study of situational interaction.

[4] Situational data also clarifies relationships. For example, individual-level data relating to a high crime propensity individual who offends frequently but who is only sometimes unsupervised would weaken the effect of the 'unsupervised' variable on crime outcome; yet situational data about the same individual may instead clarify and strengthen this relationship by determining that actually the individual only offends when they are unsupervised, even though this time is rare.

[5] Hypothetical scenario data is slightly simpler to collect and is capable of assessing situational interaction, but only in hypothetical behavioural outcomes or intentions to act. This method is discussed in section 7.3.1:.

7.1.1: Approaches to studying situational interaction

As described, the additive approach is incompatible with the study of situational interaction; however, research into situational interaction often uses additive analytical methods, data or both. For this reason the different approaches to the study of situational interaction are described and evaluated below. The additive and interactive worldviews each determine both analytical methods and data collection methods. When both of the resultant two kinds of analytical methods are applied to the resultant two kinds of data structures, four combinations that define potential approaches to the study of person-environment interaction are apparent. These approaches determine whether studies capture and study convergence (situational interaction) or dependence (statistical interaction). These approaches to the study of person-environment interaction are summarised in Table 5.

Table 5: Methodological approaches to studying situational interaction

		Analytical method	
		Additive	Interactive
Data collection method	Additive	1: Dependence *(individual level variables)*	(2: N/A)
	Interactive	3: Dependence *(situation level variables)*	4: Convergence

Approaches One and Two (Table 5) both collect and analyse non-situational data. Approach Two is technically impossible to undertake in reality because the application of interactive analytical methods, by definition, requires a situational data structure. Approach One analyses non-situational data for evidence of statistical interaction using regression methods. The specifics of various methods used within this approach are described in section 7.2:. The first empirical chapter of this thesis (chapter 9) uses this approach. Approach One is the most common approach taken to the study of person-environment interaction. Since the development of SAT, using regression methods to assess person-environment statistical interaction in individual level data is an increasingly common approach in criminology to test data for evidence in support of situational interaction in the process leading to acts of crime[6] (e.g., Hirtenlehner & Hardie, 2016; Hirtenlehner, Pauwels, & Mesko, 2014; Hirtenlehner & Treiber, 2017; Svensson, 2013; Svensson & Pauwels, 2010; Wikström, 2009; Wikström et al., 2010; Wikström, Oberwittler, et al., 2012;

[6] Or also in the process leading to willingness to commit particular offenses in the future (Kroneberg et al., 2010).

Wikström & Svensson, 2008; Wikström et al., 2011);[7] some such studies employ hierarchical or multi-level forms of regression (e.g., Eklund & Fritzell, 2013; Pauwels, 2011; Zimmerman et al., 2015).[8]

However, although these studies provide evidence that is consistent with individual level effects that would be expected as a result of the proposed situational processes, Approach One cannot appropriately afford conclusions about those situational processes. Any evidence of person-environment interaction in non-situational data involves an inference of co-occurrence (at the individual and environment component level), and additive analytical methods can only evidence dependence (statistical interaction). However, this approach does afford statements about individuals and the differential effect of exposure on individuals. For example, Wikström et al., (2012) demonstrate a statistical interaction effect between (individual) crime propensity and criminogenic (environmental) exposure using individual level questionnaire data that are not spatio-temporally connected and conclude that "levels of criminogenic exposure predicted crime involvement only for young people with higher crime propensities" (p. 407). Wikström et al., (2012) then acknowledge, however, that analyses of this kind "do not demonstrate that a particular person (with a particular crime propensity) is actually in a particular setting (with particular criminogenic features) when he or she commits an act of crime" (p. 407) and go on to conduct situational analyses (see Approach Four, described below). Approach One cannot provide a test of the causal situational process that SAT suggests is the cause of acts of crime.

Approaches Three and Four (Table 5) analyse situational data for evidence of situational interaction. Situational data captures the convergence of individuals and environments in time and space. This kind of data is very uncommon in criminology, and furthermore, not all analyses of this situational data aim to assess person-environment interaction. Therefore, only six studies in criminology to date take Approach Three or Four. These six studies, and additional studies that analyse situational data but do not address situational interaction are discussed in section 7.3.1:.

Three studies in criminology take Approach Three (Table 5) and use additive methods to analyse situational data for evidence of person-environment interaction in either behavioural outcomes (Beier, 2017) or hypothetical outcomes (Eifler, 2016;[9] Haar & Wikström, 2010), see further

[7] Some of these studies are cited below because they also use additional methods and data, meaning that they also evidence convergence and situational interaction.
[8] Beier (2017) also uses multi-level modelling, but applies this analytical technique to situational data – see Approach 3 below (and also section 7.3:).
[9] See also, Eifler (2015), published in German.

section 7.3.1:. Ultimately, this approach can still only evidence dependence, but since the assumption of convergence is at the situation level, this approach represents the most accurate use of regression-based additive methods for evidencing situational interaction.

Approach Four (Table 5) uses situational data and interactive analysis to determine the situational conditions under which an act of crime is more or less likely, for example, under convergent conditions of high or low crime propensity and weak or strong moral context. Chapter 10 takes this approach (the specifics of this strategy are described in section 7.3.2:). This is the only approach that can study the effects of convergence and thus evidence situational interaction in the action process, and only five previous studies in criminology have achieved this. Four of these studies have applied this approach using powerful comparative descriptive presentations of situational data (Haar & Wikström, 2010; Pauwels, 2018, in press; Wikström et al., 2010; Wikström, Oberwittler, et al., 2012),[10] though only two of these studies analyse real world behavioural outcome data (Wikström et al., 2010; Wikström, Oberwittler, et al., 2012). Only one study to date in criminology has conducted a truly appropriate study of situational interaction using inferential statistics (Wikström, Mann, et al., 2018, in press), see further section 7.3.1:.

Approach Four is crucial to demonstrate convergence and accurately study the situational action process. When utilising inferential statistics, this approach demands data that captures the convergence of people in environments be analysed using analytical methods that are compatible with the interactive worldview and such situational data. Such inferential statistics are most likely to have been developed outside criminology or psychology. This is because traditionally in these fields the unit of analysis is the individual, and classical statistical methods are additive and independent. Methodological options for collecting situational data are limited. However, recently within and without the criminological literature, there has been revitalised consideration and development of innovative methodologies that aim to capture individuals' exposure to environments and their features (e.g., Basta, Richmond, & Wiebe, 2010; Browning & Soller, 2014; Chaix et al., 2012; Gesler & Albert, 2000; Humphreys, Panter, Sahlqvist, Goodman, & Ogilvie, 2016; Perchoux, Chaix, Cummins, & Kestens, 2013; Schönfelder & Axhausen, 2003; Wiebe et al., 2014; Wikström, Oberwittler, et al., 2012; Wikström, Treiber, et al., 2012).[11] It is likely that innovative applications of technology will impact upon future advancements in

[10] Most also apply some classical inferential statistics in order to test the significance of effect sizes.

[11] Whilst these proposed or developed methods are promising for the study of situational interaction, the data is or will be applied to different research questions. Most of these discussions, methodologies and studies are concerned with the effects of exposure, and not even the differential effect of exposure on different individuals. With the exception of those who have developed methods in order to test SAT (i.e., Wikström, Oberwittler, et al., 2012; Wikström, Treiber, et al., 2012), none of these researchers are interested in applying these methods to the study of situational interaction in the process leading to action.

situational methods. For example, immersive virtual reality technologies that use wearable technology such as Google Glass or Oculus Rift could allow users (participants) to explore and respond to (potentially interactive) environments that are built and manipulated using technologies of animation, motion capture or 3D recording. Such developments in analytical and methodological procedures are promising for the future of this uniquely appropriate approach to the study of situational interaction.

Approach Four cannot, however, appropriately afford conclusions about individuals or environments. When the unit of analysis is the situation, analysis or description of situational data is not concerned with where or how the situational conditions originate. Counter to the ingrained status quo in criminology and classical statistics, the individual or environmental roots of the features of situations are not relevant for situational analysis. Whilst this means that the situational data does not have to be nested within individuals or environments (or simultaneously, both) for analysis, it does mean that findings only apply to situations. For example, situational analysis alone cannot determine that particular kinds of individuals are situationally vulnerable or resistant to particular kinds of environmental exposure. However, it can describe the particular convergent conditions under which crime is more or less likely (e.g., the likelihood of crime under conditions of high crime propensity and a weak moral context can be compared to that under conditions of low crime propensity and strong moral context). Whilst the findings about criminogenic convergent conditions afforded by situational analysis are at the situational level, they can be compared with what we would expect to see were the situational process functioning as hypothesised. The assumptions necessary to make such a comparison relate to the individual level of measurement of some constructs, for example, that a person's generalised level of propensity is approximately related to how they respond to settings (section 8.3.1:). This kind of assumption is less problematic for conclusions about situational processes than the aforementioned assumption of convergent data made by studies that use evidence of statistical dependency at the individual level to evidence situational interaction.

7.1.2: Summary

The types of questions asked by the interactive paradigm refer to people in environments which cannot truly be assessed by the analytical approach to data collection and analysis developed by the additive paradigm to study people and environments. Even if statistical interaction (i.e., dependence) is demonstrated (e.g., by a significant interaction term, a disconfirmation of multi-group invariance of causal structure, or differing gradients on a visual graph; see section 7.2:); the use of independent (non-situational) data about people and environments or additive regression-

based methods don't and can't truly demonstrate situational interaction (i.e., convergence) in the action process. Rather, they evidence a dependency effect.

A demonstration of a dependency effect in independent data immediately raises questions about specifically how this interaction occurs. In this way, theory is important for the study of interaction (Olweus, 1977) because it is the proposed processes involved that explain the statistical relationships between variables and, in the case of statistical interaction effects, these can be particularly difficult to interpret (Aiken & West, 1991; Wikström & Svensson, 2010). SAT provides a model of person environment interaction that explains action, including acts of crime. Situational analysis of situational data can provide evidence that supports or refutes such a situational model.

Conducting situational analyses such as those advocated by Approach Four (see Table 5) is not a simple or perfect solution to studying situational interaction, however. Firstly, situational data is very difficult to capture. The complexity and expense of situational data collection can be off-putting or prohibitive; and often results in binary measures of exposure to contexts that are difficult to quantitatively capture and characterise. Gathering situational data may even be impossible, for example; when funds, time or expertise are inadequate; when the research setting or population are not conducive to this kind of data collection; or when re-analysing existing datasets or historical data. In the absence of situational data that captures individual-environment convergence and allows for the assessment of situational interaction, the traditional approach (Approach One) is the next best option. Secondly, to provide useful findings and recommendations to policy makers and practitioners, researchers may want to use findings about situational processes to draw conclusions that are relevant to individuals or environments. Situational analyses afforded by Approach Four can evidence the situational process. In the light of such evidence, additional individual level analyses afforded by Approach One can evidence the effect of this situational process on relationships at the individual level. This thesis takes such a combined approach to the study of situational processes and conducts traditional analyses of individual level data to evidence dependence in chapter 9 and presents descriptions of convergence in situational data in chapter 10, in order to draw a broad range of conclusions about the situational role of parental monitoring in adolescent crime.[12] The following section

[12] Some previous tests of the situational model of SAT also demonstrate both dependency and convergence which means they are able to draw broad conclusions about both situational processes and the implications of this for individual level behaviour (e.g., Haar & Wikström, 2010; Pauwels, 2018, in press; Wikström et al., 2010; Wikström, Oberwittler, et al., 2012).

(7.2:.) introduces additive regression-based methods; interactive situational methods are introduced in section 7.3:.

7.2: The traditional approach: Demonstrating dependence

Traditionally, person-environment interactions have been assessed using data that is not spatio-temporally linked (i.e., it captures individuals *and* environments not individuals *in* environments). Data used for these analyses is collected at or aggregated to the individual level (i.e., the unit of analysis is the person). Most commonly, multiple linear regression methods are then used to study statistical interaction (for (critical) discussion, see, Edwards, 2009; Lubinski & Humphreys, 1990).[13] There are a number of methods for studying interaction using regression methods (for a discussion see, e.g., Jaccard, Wan, and Turrisi (1990)), but one common method is for researchers to estimate interaction terms in order to "infer how the effect of one independent variable on the dependent variable depends on the magnitude of another independent variable" (Ai & Norton, 2003, p. 123; see also, Friedrich, 1982). For example, in an attempt to assess the person-environment interactions predicted by the integrative theoretical model of SAT, an individual-level measure of individuals' exposure to aspects of criminogenic environments[14] is entered alongside a measure capturing individual characteristics (i.e., crime propensity) into a regression model predicting a crime behaviour outcome; then, a multiplicative interaction term is also added to the model. If this statistical interaction term is significant in the regression model and its inclusion changes the *F*-value of the model, it suggests that there is interaction inherent in the data (J. Cohen, Cohen, West, & Aiken, 2013; Jaccard et al., 1990).[15]

Demonstrating statistical interaction of any kind is far from straightforward, particularly in non-experimental research (Edwards, 2009; Jaccard et al., 1990; Lubinski & Humphreys, 1990; McClelland & Judd, 1993). For example, there are particular complications when testing for interaction effects in linear regression models, for example relating to quadratic trends and measurement error, both of which are neatly summarised by Edwards (2009) and empirically tested by Lubinski and Humphreys (1990). Firstly, "measurement error drastically reduces the

[13] This includes analysis of variance such as ANOVA.

[14] Or a measure of exposure that is aggregated to the individual level, see section 8.3.2:

[15] Some studies of interaction refer to moderation. Moderation is a specific kind of interaction effect and mathematically they are the same. The difference is that moderation distinguishes between the roles of the two variables involved in the interaction. A moderator is a single variable (*Z*) which moderates (or conditions) the effect of another variable (*X*) on the outcome (*Y*) (e.g., the effects of job demands (*X*) on illness (*Y*) are weaker when employees have control of their work environment (*Z*) (Edwards, 2009)), i.e., the effect of *X* on *Y* is dependent on *Z*. This moderation is assessed using a multiplicative interaction term (*XZ*). Interaction also uses a multiplicative interaction term (*XZ*), but the dependency is bi-directional so that the effect of both *X* and *Z* are dependent on the other (e.g., neither individual (*X* or *Z*) nor environment (*X* or *Z*) factors independently cause crime (*Y*), it is via their interaction (*XZ*) that acts of crime occur (as described by SAT)).

power to detect moderator effects" (Edwards, 2009, p. 149), and may be "one of the reasons that moderator variables have been particularly hard to tie down" (Lubinski & Humphreys, 1990, p. 386). Measurement error can be a big problem for the reliability of the product term even when the reliabilities of the independent variables are adequate, and this is a difficult problem to rectify (or even quantify).[16] Regarding quadratic trends, although there are benefits and drawbacks of doing so,[17] researchers should include the quadratic terms of the involved predictors into the regression model with the multiplicative interaction term in order to account for nonlinearity of relationships, because "moderation can be inferred when curvilinearity is actually responsible for the variance explained by *XZ*" (Edwards, 2009, p. 153; see also, Lubinski & Humphreys, 1990).

One of the biggest problems for assessing interaction in linear models within criminology is that individual crime frequency is a discreet variable and typically has a zero-inflated negative binomial distribution, particularly amongst a representative sample. Some suggest using different crime outcome measures (such as measures of variety, e.g., Sweeten, 2012), however, since alternative measures capture a different aspect of offending (which is not necessarily of interest), they avoid the problem rather than solve it. Furthermore, other crime outcome measures typically also display skewed distributions anyway and the main problem is that the often large number of zeros (non-offenders) cannot be linearised. As for any (non-interactional) analyses, this awkward distribution causes a problem for linear models (Agresti, 1996; Osgood, Finken, & McMorris, 2002). Usually, the use of non-linear models (e.g., negative binomial, logit, or probit) is advised to take account of the problematic distribution of the dependent variables (e.g., Gardner, Mulvey, & Shaw, 1995; Hilbe, 2011). However, these methods are not advisable for assessing interaction because the addition of product terms to such models does not perform well at capturing moderation relationships (for specific and technical detail, see, Ai & Norton, 2003; Berry, DeMeritt, & Esarey, 2010; Bowen, 2012; Hirtenlehner & Hardie, 2016; Hirtenlehner & Treiber, 2017; Svensson & Oberwittler, 2010).

The alternative to using non-linear models for addressing problematic distribution of the dependent variable is to transform the dependent variable (i.e., log, square root, and reciprocal transformations; and also reverse score transformation for negatively skewed data). However, transformations of the magnitude required to normalise outcome data such as crime frequency

[16] Edwards (2009) and Lubinski and Humphreys (1990) suggest using the work of Bohrnstedt and Marwell as a starting point.

[17] Controlling for the squared terms X^2 and Z^2 can help to avoid Type I error (falsely assuming an interaction effect) when they are uncorrelated with *XZ*, however, if these quadratic terms *are* correlated with *XZ*, their inclusion can increase type II error (falsely rejecting a 'true' moderation effect), essentially reducing the likelihood of finding an interaction effect. Otherwise, if left uncontrolled, the likelihood that moderation is incorrectly inferred (Type I error) increases. For a discussion and further reading, see Edwards (2009).

are problematic when assessing interaction effects as not only do results become difficult to interpret (Hannon & Knapp, 2003; Svensson & Oberwittler, 2010), but more fundamentally, particular relevant features of the distribution are crucial in order for accurate conclusions to be drawn and any interaction effect to be established. For example, the large proportion of a probability sample who are non offenders and the very small number of very high frequency offenders are important features of the distributions of crime frequency that are very relevant for our understanding of crime and should be protected. As Russell and Dean note, "when gross deviations from parametric assumptions are observed, conventional data transformations are often applied with little regard for substantive theoretical implications" (2000, p. 166). In transforming data we may inadvertently be "throwing away the most precious commodity we deal with: information" (J. Cohen, 1990, p. 1306). For example, notoriously 'shy' interaction effects are often further sensitive to log transformation of the outcome variable because all strength of the effect is lost with the removal of such vital variation (Hannon & Knapp, 2003; Russell & Dean, 2000).

Categorisation (including dichotomisation) of the dependent variable is another way by which researchers try to solve the problems caused by zero-inflated negative binomial distribution. For example, Ai and Norton (2003) developed a procedure for use with logistic regression, which estimates interaction effects on a dichotomised crime prevalence outcome. The 'Inteff' procedure provides estimates of the average overall interaction inherent in the data, whilst allowing for the confounding of two types of interaction within the model (one associated with the interaction term included in the model, the other resulting from the link function utilised by the model itself). As with all regression models that attempt to assess interaction effects, this 'Inteff' procedure is not without limitations: it is only available for binary models, and only able to estimate one two-way interaction at a time.[18] It also suffers the same drawbacks as other transformations of the dependent variable.

In order to avoid such problematic transformation of the dependent variable, Svensson and Oberwittler use an unlogged skewed dependent variable in an OLS regression, but then "apply several safeguards against the pitfalls of skewness and the resulting violation of assumptions" (2010, p. 1008). They describe the rationale for each of three safeguards; i) computing heteroskedasticity-robust standard errors to correct for the heteroskedasticity of residuals;[19] ii)

[18] In addition, there is some discussion in the statistical community that is contested and as yet unpublished, about a potential problem with the calculation of the standard errors of regression coefficients within the Inteff procedure.
[19] There are alternative robust methods to this one, including bootstrapping (which estimates the properties of the sampling distribution from the sampling data) (Efron & Tibshirani, 1994). Robust methods are an alternative to

comparing results with those from Tobit regression models (which are designed to deal with potential 'floor effects' of left-censured data) in an attempt to avoid Type I error (which falsely assumes a moderation effect); and iii) including the quadratic terms of the involved predictors into the regression model with the multiplicative interaction term in order to account for nonlinearity of relationships as discussed above (for a discussion, see, Edwards, 2009).

There is another method that allows some attenuation of the difficulties of both a skewed dependent variable and relationships between independent variables. Conducting a path analysis by using MPLUS software (or AMOS) without including latent variables (and factor analysis) is similar to linear regression, but the path analysis has the main benefit that it allows for a flexible pattern of relationships, and this flexibility allows for the correction of estimates that may have been biased by relationships of any kind (not just quadratic) between independent variables. The flexible pattern of relationships permitted by the path analysis also allows for multiple dependent variables. Conducting this kind of analysis using this software also simplifies the process because it has built-in options to use a robust estimator which corrects coefficients for a skewed dependent variable, or an estimator that accounts for the nature of the dependent variable by running the type of regression that is appropriate for the data. Of course, the complications of correcting a skewed dependent variable still exist despite these measures.

Another approach to evidencing statistical interaction is a multiple group test method, which involves testing for the equivalence of a causal structure using a Structural Equation Model (SEM). This method was born out of the analysis of variance (ANOVA) tradition. The drawback of this method is that because it is rooted in comparison of groups, it necessarily requires the moderator variable(s) to be categorical (or categorised for this purpose).[20] In a similar way to the process of transforming a dependent variable discussed above, such categorisation may result in a loss of variance which may be crucial for the observation of a statistical interaction effect. Since ANOVA is unable to assess (and compare) the size of the effect within each group, which is necessary to assess interaction, this method uses an SEM with an ad hoc test for the equivalence of structure. This invariance testing strategy allows us see to what degree an effect is operating equivalently across the groups, where the groups represent a categorisation of the moderator. Assessing the presence of interaction is conducted by assessing the difference in goodness of fit statistics between a baseline model (whereby the regression is estimated freely in each group) and a comparison model (in which the regression coefficients testing the relationship between the

transformation of the dependent variable that aim to resolve the problems associated with a non-normally distributed dependent variable.

[20] See footnote 15 for a distinction between moderation and interaction.

predictor and the outcome are constrained to be equal across groups). A significant deterioration in model fit in the comparison model as opposed to the baseline model means the regression coefficient is non-equivalent across the groups; i.e., some interaction/moderation is occurring.[21] These SEM models for testing moderation have been largely ignored because unfortunately, most researchers testing for moderation effects use forms of SEM that are reliant on maximum likelihood estimation, and the natural non-normality of product terms[22] results in violation of the assumptions of maximum likelihood estimation. However, there are methods to address such problems which are proving effective and becoming more accessible (Edwards, 2009); or researchers can use SEM models that rely on robust maximum likelihood (MLR). These models also retain the benefits of path analysis described above (i.e., they correct estimates based on relationships between independent variables and make robust estimates that correct coefficients for skewness in the dependent variable). Despite their complexity, these models hold much promise for the study of statistical interaction effects and are becoming simper to use (Edwards, 2009).

Finally, visual assessment can be a very useful way to assess the effect of interaction between variables on a dependent variable. As well as being able to depict the presence of interaction, this is often a more straightforward way to understand the nature of difficult to interpret statistical interaction effects. Interaction between variables in graphs such as these is signified by a gradient of association between one independent variable and the dependent outcome that increases or decreases according to an increase or decrease in the other dependent variable. These interaction graphs do not require any transformation of the dependent variable, and therefore crucial variance is not lost. However, like the test for multi-group invariance, to be easily interpretable the graphs do require categorisation of the independent variables. Due to processes of selection and interrelationships between these variables, the distribution of participants between these groups may be unequal (see section 9.1.2:). In very small groups, the outcome variable can become very unstable and therefore unrepresentative, and in some cases certain groups may need to be excluded from graphs. In this sense, visual assessment of interaction is also an imperfect method. This difficulty with small groups and therefore the potential effect of outliers and influential cases must be borne in mind at the time of presentation and interpretation of

[21] Byrne (2010) observes that a difficulty with this procedure is that the conclusions based on the change in two goodness of fit statistics ($\Delta\chi^2$ and ΔCFI) can be different, suggesting that simultaneously there is equivalence and non-equivalence across groups (interaction and no interaction) in the same data; however, since the χ^2 goodness of fit statistic is so sensitive to sample size, many researchers now effectively ignore it. Therefore, the requirement to "choose the approach which we believe is most appropriate for the data under study" (Byrne, 2010, p. 271) is not problematic and the correct conclusion clear.

[22] Product terms are not normally distributed even when the variables that constitute them are normally distributed (Edwards, 2009)

interaction graphs in order to avoid misleading audiences. In addition, care must be taken that the relative scales chosen with which to graph the data do not mislead the eye. However, a major benefit of this visual method is that the nature of any interaction inherent in data is easier to interpret than it is for example as a significant interaction term in a regression model.

This methodological discussion about demonstrating statistical interaction highlights the many problems with these kinds of analyses. Many traditional methods are imperfect for assessing statistical interaction effects. This is not to say that such analyses are incapable of providing support for interaction, it just means that we must be careful when concluding that interaction is not apparent in analyses that do not find a statistically significant multiplicative interaction term or inconsistent evidence of group invariance. Equally, we should also take measures to avoid type I error (to falsely assume a moderation effect). In addition, statistical interaction is difficult to interpret correctly, particularly higher order (e.g., three-way) interactions, and there are pitfalls to avoid in doing so. For example, Braumoeller says of the political science literature that "the focus has been on running, or even flying, when the fundamentals of walking have yet to be made clear. Nowhere is this fact more apparent that in the case of the humble interaction term" (2004, p. 807); and a survey of research employing multiplicative interaction terms found only 10% of political science papers used and interpreted them correctly (Brambor, Clark, & Golder, 2006).

It is quite sensible to assess dependency using multiple tools (e.g., Hirtenlehner & Hardie, 2016). Statistical interaction effects are notoriously sensitive and different procedures may show differing results. As far as is it is possible to ascertain, it seems that all methods used to assess statistical interaction are beset by difficulties and limitations. Corrections and procedures that resolve one methodological problem introduce another. For example, OLS regression, the Inteff procedure and SEM for testing multi-group invariance all assess interaction using different methods. In addition, they all remove crucial variance from the key variables, in different ways; Inteff uses a binary outcome variable whereas the OLS regression model uses a log transformed continuous frequency variable, and the invariance testing strategy requires a categorical moderator variable. Multiple methods can be applied to the same data to assess statistical interaction in order to build a picture of interaction (or its lack), even when some methods might provide contradictory or unclear results. This is the approach taken in chapter 9, which conducts traditional empirical analyses of statistical interaction (dependence) in individual-level data.

7.3: Analysing situational interaction: Assessing convergence

Establishing whether statistical interaction is present in data is clearly problematic. However, more fundamental to the study of situational interaction is the problem that statistical interaction only evidences a dependency effect. Additive regression methods and independent data on individuals and environments do not allow us to answer, or even ask, the 'how' questions that are fundamental to the interactive worldview inherent in the situational approach of this thesis. SAT's perception-choice process is the explanation of action that addresses the 'how' question. Analysis of dependence cannot inform us about situational interaction in the action process.

The remainder of this chapter describes how situational data about individuals *in* environments, explored within a plausible theory of situational action, can evidence the convergent criminogenic conditions under which an act of crime is more likely (and, conversely, the nature of convergent conditions under which crime is less likely).

7.3.1: Existing criminological research using situational data

In criminology, two kinds of situational data have been collected; Space-Time Budget (STB) data and certain kinds of scenario response data. Designed to provide data capable of testing the core propositions of SAT including the situational model, the Peterborough Adolescent and Young Adult Development Study (PADS+; Wikström, Oberwittler, et al., 2012) has led advances in situational data methodology in criminology. PADS+ is the only study in criminology to collect both these kinds of situational data. At the time of writing, there are just seven publications that use STB or scenario (situational) data to attempt to assess situational interaction in the process leading to acts of crime and rule-breaking (Beier, 2017; Eifler, 2016;[23] Haar & Wikström, 2010; Pauwels, 2018, in press; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012). These publications are described and categorised in this section.

Randomised hypothetical scenarios (factorial surveys) present a method for experimentally manipulating features and circumstances of environments and settings and recording particular individuals' hypothetical behavioural responses (Rossi & Anderson, 1982; Rossi & Nock, 1982; Wallander, 2009). The method allows for situational analysis of the (hypothetical) behavioural outcome of the intersection of a particular person in a particular environment, though it has rarely been applied to the study of situational processes as defined by SAT (Wikström, Oberwittler, et al., 2012).

[23] See also Eifler (2015) which is published in German. There may be other additional relevant publications in other languages.

There are four studies that use situational scenario data to study situational interaction. All test propositions of the situational model of SAT. Eifler (2016) analyses situational data from a postal factorial survey conducted in Germany; finding some evidence of situational interaction in regression models that show statistical dependency between features of individuals and hypothetical scenarios in predicting willingness to commit theft by finding in response to these situations.[24] Wikström et al., (2012, pp. 388-393) and Haar and Wikström (2010) analyse situational randomised scenario data from PADS+, and Pauwels (2018, in press) analyses situational data from an online Belgian factorial survey. These three studies illustrate evidence of situational interaction using 3D graphs that depict rates of violent responses to situationally randomised hypothetical vignettes that are compared across different hypothetical convergent conditions (of propensity and conduciveness). The unit of analysis in these three descriptive presentations is the (hypothetical) situation. Wikström, Oberwittler, et al. (2012) and Pauwels (2018, in press) also conduct risk ratio, *chi²* and logistic regression comparison of these rates to support the situational findings of these descriptive statistics. Haar and Wikström (2010) contribute a Rasch model analysis. This Rasch model analysis of situational data provides evidence of dependency (albeit at the most accurate scenario level) that is consistent with situational interaction.

The Space-Time Budget (STB) is a unique specialist methodology for capturing data about the convergence of individuals and environments in time and space and can make a unique contribution to the study of situational interaction in crime causation (Wikström, Oberwittler, et al., 2012; Wikström, Treiber, et al., 2012). The STB has been developed for criminology primarily by the Peterborough Adolescent and Young Adult Development Study (PADS+; Wikström, Oberwittler, et al., 2012).[25] The PADS+ study and STB research tool is described in detail in sections 8.1: and 8.2.2.1:. Complex time use data from the STB can be and has been used in non-situational analyses in studies of non-situational processes, but the real strength of STB data (and the justification of its cost) lies in its almost unique ability to facilitate situational analyses (i.e., analyses of person environment interaction). The PADS+ STB method has been fully replicated

[24] See footnote 23.

[25] Outside criminology, the Space-Time Adolescent Risk Study (STARS) based at the Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania School of Medicine, developed a similar method. The research aim of the study and publications so far study relationships between the risk or fear of violence and physical exposure to neighbourhood features, and the data has not been used to analyse situational interaction (e.g., Basta et al., 2010; Morrison, Dong, Branas, Richmond, & Wiebe, 2017; Wiebe et al., 2016; Wiebe et al., 2014). The Adolescent Health and Development in Context (AHDC) study in Ohio, USA is currently developing a similar method to the STB but this sociological study will be focused on the role of exposure in developmental rather than situational processes that result in risk behaviour outcomes.

in the Netherlands (SPAN) and in Sweden (MINDS), and in part by studies in Slovenia and Canada.

To date, none of the studies that replicate the PADS+ STB method have published situational analyses using situational STB data. The Study of Peers, Activities and Neighbourhoods (SPAN) in The Netherlands is so far the only research study to replicate the PADS+ STB that has published findings using this STB data.[26] Most of these SPAN publications aggregate the STB data to the individual level to conduct traditional regression-based analyses of the role of environmental and setting factors in individual offending (Bernasco, Bruinsma, Pauwels, & Weerman, 2013; Hoeben & Weerman, 2013, 2016; Janssen, Eichelsheim, et al., 2017; Janssen, Weerman, et al., 2017; Weerman et al., 2015),[27] and do not address person-environment interaction. Two publications produced using SPAN STB data conduct analyses at the hour level and incorrectly state that they assess situational explanations of offending (Bernasco, Ruiter, et al., 2013) and victimisation (Averdijk & Bernasco, 2014). Despite using rare data that captures person environment convergence, the analyses in these publications explicitly hold individual 'confounders' constant and assess the impact of specific environmental and setting features on victimisation or crime outcomes at the hour level. These studies therefore do not involve situational analyses of person-environment interaction.

There are, to date, four publications that use situation-level STB data to assess situational (person-environment) interaction in the process leading to acts of crime or rule breaking (Beier, 2017; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012).[28] All use PADS+ STB data and all test and find support for the propositions of the situational model of SAT.

Beier (2017) compares probabilities of rule-breaking (adolescent alcohol consumption) arising from different convergences of propensity and moral context (situations). These probabilities are calculated using multilevel multivariate linear probability modelling. One level of the model nests the hours within the person spending those hours, which means that at this level of the model the model infers that the propensity and substancegenic[29] peer influence conditions of interest co-occurred. This inference of convergence is made at a more accurate hour level than the

[26] To date, no publications using data from the studies based in Sweden, Canada or Slovenia use STB data.
[27] Additionally, Janssen et al. (2014) use an individual level aggregate of criminogenic exposure as a dependent variable in an analysis of the role of parenting factors.
[28] Adolescent (underage) alcohol consumption is the studied behavioural outcome in analyses by Beier (2017).
[29] Gustafsson (2017) proposes the concept of 'substancegenic' as being similar to SAT's concept of criminogenic but with reference to substance use; i.e., substancegenic refers to a moral context in which the moral rules and their enforcement encourage (or do not discourage) substance use.

inference made by Approach One (Table 5 on page 212), meaning that the assumption of convergence is more likely to be correct. However, despite the improved accuracy gained by applying additive analytical methods to data that is situational, strictly speaking the additive analytical method cannot evidence convergence (Approach Three).[30]

Wikström et al. (2010); and Wikström, Oberwittler, et al. (2012, pp. 347-363) demonstrate situational interaction by calculating and comparing the crime rates for different situations (convergences of propensity and moral context). Visually powerful graphs of these comparative rates illustrate the nature of the situational interaction inherent in the situational data, and (Wikström et al., 2010) also demonstrate that the magnitude of the relevant differences in these rates is statistically significant. These studies truly evidence the effect of convergence, and arguably, do not need to use inferential statistics to do so successfully.

By applying an interactive analytical method never before used in criminology, Wikström, Mann, et al. (2018, in press) use a machine learning (artificial intelligence) technique to estimate the conditional probability of an act of crime occurring under particular convergent conditions relating to propensity and moral context. Crucially, the situation is the unit of analysis in the artificial neural network models of the likelihood of crime, which at no point nest or aggregate these situations and therefore negate the need to assume convergence. This is the only study that conducts truly situational inferential analysis of situational data to study the role of situational interaction in the action process that leads to acts of crime.

The second empirical chapter of this thesis (chapter 10) continues this approach to the study of person-environment interaction (i.e., Approach Four - situational analysis of situational data). Chapter 10 uses predominantly situational data to describe the convergent conditions of the presence of guardians, perceived parental knowledge of the circumstances of activity, and crime propensity that, together, make acts of crime more or less likely. The following section details this situational strategy.

7.3.2: Describing situational interaction: comparing crime rates

The PADS+ STB data is crucial for the situational analyses in chapter 10. For a detailed description of the PADS+ STB methodology and data used in this thesis, see section 8.2.2:. The STB collects data from each individual participant about the details of each hour during a period of their daily lives, including whether they offended or not. Details about the features of those same individuals and further information about the environments to which they are exposed is

[30] Haar and Wikström (2010) similarly nest scenarios within individuals in order to conduct Rasch model analysis.

collected using other methods and then applied to STB hours according to the identity of the person who spent the hour or the identity of the setting or location in which the hour was spent (Wikström, Treiber, et al., 2012). Single hour STB units capture situations, i.e., person-environment interactions (the features of the setting and its circumstances and the characteristics of the person in that setting) and the resultant binary crime outcome.[31] The unit of analysis (i.e., case) is the situation. This fundamental feature of the STB data structure makes this data situational and affords the analysis of situational interaction.

Chapter 10 takes an approach to the study of situational interaction that presupposes that the complexity of demonstrating situational interaction lies in the collection, management and structure of situational data, not necessarily in the analysis. The evidence of situational interaction presented by Wikström, Mann, et al. (2018, in press) is compelling, but interactive inferential methods are extremely specialist techniques that are beyond the scope of this thesis. However, inferential methods are not necessary to demonstrate situational interaction in situational data (and are not capable of demonstrating situational interaction in non-situational data, see section 7.1:). When the complexity and richness of situational data is not squandered, even interactive statistical methods provide only additional confirmation of situational effects that can be discovered using simple descriptive methods.[32] As J. Cohen (1990, p. 1305) said of data analysis, 'simple is better'. If the most simplified method is capable of accurately and adequately demonstrating situational interaction (or its lack), the simple method should not be spurned for being unsophisticated and can make a valuable contribution to building a catalogue of evidence.

In order to evidence situational interaction in the process leading to behavioural outcomes such as crime, situational analyses or description of situational data must demonstrate that the likelihood of an act of crime varies by the convergent conditions that characterise situations. For SAT, the relevant situational conditions for acts of crime are crime propensity and the moral context. For the analysis, in principle, the measures of these features can be continuous, categorical, or a combination of data types.

[31] Binary outcome data means that studies that analyse behavioural outcomes using hour-level STB data report risk ratios, tetrachoric correlations, probabilities, rates or a combination of these (e.g., Beier, 2017; Bernasco, Ruiter, et al., 2013; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012).

[32] For example, the substantive conclusions based on descriptive analyses of situational STB data (Wikström et al., 2010; Wikström, Oberwittler, et al., 2012) have been replicated using sophisticated statistical analyses (Wikström, Mann, et al., 2018, in press). This kind of inferential analysis is able to statistically characterise the interaction (and therefore evidence that the relationship between factors is not linear, and quantify the impact of a change in particular conditions, but the simpler rate comparisons also adequately demonstrate situational interaction.

The simplest method is to first define particular convergent conditions of interest based on the intersection of categorical measures of features of people and environments.[33] For example, when persons of low or high propensity spend time in moral contexts that are weak or strong, four kinds of situations with differing convergent conditions result. The number of hours that fall into each situation category can differ (due to processes of selection – see section 2.4: and 5.2.2:). The aim of 'simple' situational analysis is to then demonstrate whether or not the behavioural outcomes of those four kinds of situations are different, irrespective of different group sizes. Most of the empirical findings presented in chapter 10 are actually comparative presentations of descriptive rates of crime calculated at the situational level.[34] These rates are the number of crime hours that occur during all hours spent under any given convergence of conditions; i.e., the probability of crime under those conditions. For example, within the situational (hour) level STB dataset used for the analyses in chapter 10, only 128 crimes occurred during 167,420 hours spent awake. Since crimes are rare, the crime rate is calculated as 'crimes per thousand hours'. The sum (128/167,420)*1000 gives a crime rate of 0.76 crimes per thousand hours spent awake and represents the probability of crime during hours under all conditions for the whole study period. Such a crime rate calculation takes into account differing amounts of hours that take place under different conditions, meaning that conditions under which a modest number of crimes take place but not much time is spent are not overshadowed by conditions under which a lot of time is spent and many, but proportionally fewer, crimes are committed (Wikström, Oberwittler, et al., 2012).[35]

Hour units (including crime hours) can be selected based on any conditions, and any number of rates can be calculated for combinations of conditions that are of interest. These calculations allow comparison of crime rates (probabilities) across various convergent conditions. As such, the rate of crimes under a particular moral context condition is a test of that moral context's criminogeneity. Rate comparisons can test criminogeneity hypotheses because it is possible to calculate the relative criminogeneity of any given convergence of moral context and propensity. Comparison of such descriptive rates is one form of situational analysis and can be used to

[33] Wikström, Mann, et al. (2018, in press) conduct analysis that allows for continuous data regarding individuals, but the data regarding the moral context is binary. Until we have meaningful continuous measures of moral contexts, arguably, rate comparisons (e.g., risk ratios) are adequate to assess situational interaction in the process leading to crime. Even when a continuous measure of a feature of moral contexts is available, such as collective efficacy, regression techniques may not anyway be capable of modelling the distribution of rates of rare events such as crime (see, e.g., Hilbe 2011, 2014).

[34] Although not all data used in these analyses is collected at the hour level; see section 8.2:.

[35] The effects of processes of selection (see section 2.4: and 5.2.2:) are apparent in the unequal sizes of groups of hours that are created based on the intersection of conditions (see section 9.1.2:). Selection processes are crucial to the causal process as causes of the causes, though the role of parental monitoring factors in such processes is not the subject of this thesis and is not investigated further.

confirm or reject situational hypotheses about crime outcomes (see Table 4 on page 202 for hypotheses). In chapter 10 these rates are compared visually using graphs, but also statistically.

7.3.2.1: Effect size and significance

This descriptive approach relies on comparative rates of crime. Of importance is the (relative) size of the difference between these probabilities or rates of crime under different conditions. It is the magnitude of the difference between them that is meaningful in explaining crime and drawing conclusions that are relevant for prevention and intervention. For some particular comparative rates of interest, chapter 10 reports a straightforward risk ratio (*RR*) which calculates the size of the difference between crime rates (i.e., exposed probability / unexposed probability).[36] This relative risk is therefore easy to interpret, for example, the crime rate under one set of conditions might be 15 times that of under another set of conditions.[37]

In contrast, significance is a question of existence rather than magnitude (for a discussion on the error of 'the substitution of existence for magnitude', see, Ziliak & McCloskey, 2008). Significance testing captures whether the difference observed is substantively important in the sense that it is likely to reoccur when replicated. The two-proportion z-test compares rates of crime in two different 'populations' of hours (i.e., two different situations).[38] The statistical significance of the difference between some rates of crime reported in chapter 10 uses a stringent two-tailed p value which is deemed not significant if it is higher than 0.05 (i.e., when z falls between -1.96 and 1.96[39]). Convention often requires such a significance test; however, the merits of significance testing are questionable (Selvin, 1957; Ziliak & McCloskey, 2008) and Cohen (1990) describes the "arbitrary unreasonable tyranny" of the "sanctified (and sanctifying) magic .05 level" (p. 1307). The use of the p value and the 0.05 significance level is increasingly criticised,

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[36] The risk ratios in chapter 10 are reported to two decimal places. They are calculated using the actual numbers of crimes and hours reported in the text or tables, as opposed to using the probabilities or rates which are only reported to two decimal places.

[37] A risk ratio (also called relative risk) is not the same as an odds ratio, despite being often confused or used interchangeably. Both ratios compare a binary outcome in two populations, in this case, crime outcomes in populations of hours with differing convergent conditions (e.g., exposed/ not exposed). An odds ratio is a ratio of two odds, where *odds = n events / n non-events* (which is equivalent to the probability of an event/ the probability of a non-event). A risk ratio is a ratio of two probabilities, where *probability = n events / (n events + n non-events)*. Although the numerator is the same, the denominator differs between odds and risk ratios. In this case, in each population being compared, the numerator is crime hours and for an odds ratio the denominator is non-crime hours and for a risk ratio the denominator is all hours. Note that some calculators used in medicine (which more commonly report odds ratios) give confidence intervals (e.g., http://www.medcalc.org/calc/odds_ratio.php), however these CIs are generally so wide they become unhelpful and are therefore not reported in the analyses in chapter 10.

[38] The z-test statistic is a z-score defined by $z=(p_1 - p_2)/SE$, where p_1 is the proportion (i.e., rate) from sample 1 (i.e., situation 1), p_2 is the proportion from sample 2, and SE is the standard error of the sampling distribution. An online calculator was used to calculate z, for example, www.vassarstats.net/propdiff_ind.html or www.socscistatistics.com/tests/ztest. Note that websites such as these often differ in the way that they calculate the standard error and therefore the calculated z statistic can vary slightly between sites.

[39] Since the test statistic is a z-score and is therefore normally distributed, it has an associated probability.

particularly when applied inappropriately (Gelman, Skardhamar, & Aaltonen (forthcoming); Good & Hardin, 2012; Nickerson, 2000; Ziliak & McCloskey, 2008).

The analyses presented in chapter 10 regularly involve a number of hours (cases) that exceeds 10,000 and sometimes even 30,000, and therefore the relevance of a *p* value is particularly questionable because a large *n* results in even small differences being statistically significant.[40] As Cohen states, "the null hypothesis, taken literally, […], is always false in the real world.[…] If it is false, even to a tiny degree, it must be the case that a large enough sample will produce a significant result and lead to its rejection" (1990, p. 1308). Furthermore, this method is also particularly problematic for assessing as rare a phenomenon as crime. This is because doubt is cast on the *z*-test statistic and associated *p* value when any expected cell count drops below five (or even 10) (for a related discussion regarding the chi^2 test, see, Howell, 2012, pp. 151-152). In some kinds of situations (for example, under convergent conditions of low crime propensity and strong moral context) no crimes are reported at all, in spite of a large number of hours during which such crimes could have occurred (Wikström, Oberwittler, et al., 2012). Therefore, testing the significance of the difference between these rates when one is zero is problematic.[41]

In sum, reliably demonstrating a meaningful test of significance for these comparative rates of crime is not straightforward, and it is the magnitude rather than existence of difference that is most relevant. This means that it is most useful and consistently reliable to compare crime rates arising from different situations by attention to their ratio (as a measure of effect size), whilst keeping in mind the base rate number of hours and crimes from which the rates are calculated. For this reason, in addition to reporting comparative ratios of note, chapter 10 reports the numbers and proportions of hours and crimes, and crime rate (per thousand hours for ease of reading). In addition, to appease traditionalists and despite its arguable arbitrariness, where relevant in chapter 10 the significance of the difference between rates is also reported via a two-proportion *z*-test.

[40] Technically, it is possible to simply set the significance threshold lower in the presence of a large *n*. For example, studies in physics that deal with large datasets often set the significance threshold at 0.0000001. However, data of the kind collected in this study (and many other social science studies) is not accurate to the same measurement level as much data collected by studies in natural sciences such as physics. This means such a change to an already arbitrary distinction is even more arbitrary.

[41] Risk ratios are also impossible to calculate when either probability is zero because the calculation involves dividing one by the other. In order to still report the magnitude of the difference between two rates, the convention is to add 0.5 to all four cells in the calculation of the two rates used in the RR calculation (Deeks & Higgins, 2010; Pagano & Gauvreau, 2000), though this convention was not found to be suitable for this application (in chapter 10).

7.3.2.2: A note on the absence of statistical controls

The addition of control variables into an inferential statistical equation is not possible when using this descriptive comparison method. This is not problematic because despite its descriptive nature, this method still offers a theory-driven test of specific proposed mechanisms which captures the relevant causal features and for which most commonly-used controls are unnecessary. The kinds of variables that are often included as statistical controls (e.g., attributes) cannot be causal (see section 1.2.1.2: and (Bunge, 2001; Holland, 1986)) and often "are entered into equations without theoretical reason, reflections or without the least motivation… At best, they are entered into an equation because the actual mechanism at work, which is associated with the background characteristic and the outcome variable, is not measured at all" (Pauwels et al., 2009, p. 150). (For a discussion on the 'illusion of statistical control', see, Christenfeld, Sloan, Carroll, & Greenland, 2004).

There is also evidence that the inclusion of unnecessary controls can damage the predictive power of models. In their analysis of STB hour level setting effects on acts of crime, Bernasco, Ruiter, et al. (2013) control for the time of day. However, time is an attribute of settings that cannot be causal and can only be a marker for other criminogenic factors. This is confirmed by analysis of STB data that suggests that once individual crime propensity and relevant criminogenic features of the moral context and circumstances are accounted for, day and time have no predictive value for crime (i.e., time is a marker for a selection effect on criminogenic exposure). Crucially, the inclusion of day and time variables actually significantly decrease predictive power (due to over-fitting) (Wikström, Mann, et al., 2018, in press).

7.4: Summary

This thesis explores the situational role of the presence of guardians and perceived parental knowledge of the circumstances of activity in acts of crime. The key hypotheses of interest to this study are therefore situational. Like most tests of the situational model of SAT, they require analysis of person-environment interaction. A truly situational approach to analysis is not often possible because data that captures the convergence of features of individuals and the settings they are exposed to is rare. This rarity is partly because this data is costly, challenging and labour-intensive to collect, and partly because researchers might not appreciate the unique benefits of this kind of data. Since situational data is so rare and difficult to collect, many studies assess statistical interaction in non-situational data in order to provide evidence that is consistent with (but not evidence of) person-environment interaction. Some of these traditional methods are

used in chapter 9 to empirically study the relationships between the presence of guardians, perceived parental knowledge of the circumstances of activity, personal crime propensity and crime at the individual level. However, the findings from such analyses of statistical interaction in non-situational data evidence only a dependency effect and are therefore limited for conclusions about situational processes. Chapter 10, by contrast, studies the situational relationships between these factors using predominantly situational data. The specific approach to this situational analysis is a parsimonious yet effective one; though there remain avenues for the future development of situational analytical methods.

8 Data collection and measures

This chapter describes the data used in the empirical analyses in this thesis. This involves detailing the research study, collection instruments, and specific measures used. All data was collected by The Peterborough Adolescent and Young Adult Development Study (PADS+). Section 8.1: outlines the study and sample. The presentation of the variables in section 8.2: is divided by structure of the data – for different analyses, dataset cases either represent individuals or hours. This combination of measures taken at multiple time-points at the individual or situational level is complex, so section 8.4: provides a summary of measures and a discussion of causal ordering.

PADS+ has collected extensive and detailed longitudinal data using a range of methods from more than 700 participants throughout their adolescence, and is characterised by rigorous methods, data quality, and participant retention. This data includes interviews with the participants' parents, annual survey data, official records, a community survey, and crucially, a methodologically innovative space-time budget interview which collects situational data that is uniquely capable of contributing to the understanding of the situational role of parental monitoring in adolescent crime.

8.1: PADS+: study and sample

> *"Very rarely do scholars undertake primary data collection in which studies attempt to measure all aspects of a theory"*
>
> (Weisburd & Piquero, 2008, p. 485)

The Peterborough Adolescent and Young Adult Development Study (PADS+) is an ongoing large-scale longitudinal research project based in the city of Peterborough and nearby villages. Peterborough is a medium-sized city in Eastern England.[1] PADS+ started in 2002 with the expressed aim of developing and utilising innovative methodologies to explore the role of the environment in the person-environment interaction leading to crime, and thus, to test and further develop the central hypotheses of Situational Action Theory. It is not common that whole theories can be tested using empirical data that has been specifically designed and collected for that primary purpose (Bruinsma, 2016; Weisburd & Piquero, 2008), yet this is what PADS+ data represents.

[1] The population of Peterborough was approximately 156,000 at the start of the PADS+ study. Source: 2001 UK Census.

The study has followed a cohort of approximately 700 young people from when they were 12 in 2003 to the present day, combining interviews with young people and their parents with data from various official sources and two comprehensive community surveys, to thoroughly investigate their social lives (including crime). The participants were randomly selected from among children who were entering school year seven in 2002 (aged 11) and living in Peterborough. While 281 (28.4%) families declined, moved out of the area before the first young person's interviews, or the participant was unable to take part, the 710 participants at age 13 (2004) accounted for around one-third of their age cohort in the whole city, which they closely represented across a range of demographic characteristics. For a much more detailed exposition of the PADS+ study and sample, see, Wikström, Oberwittler, et al. (2012, chapter 2). The present chapter specifically describes only the data collection instruments and measures used in this study.

8.1.1: Age and retention

This thesis uses selected PADS+ data which comprises the first four annual interviews with participants when they were aged 13-16 (2004-2007). While activities, autonomy and interpersonal relationships are changing rapidly throughout adolescence (section 3.1:), there are some periods during and points at which the changes are more or less gradual. Markers for some of the most dramatic changes are the ages at which adolescents leave primary school (age 12) and finish compulsory education (age 16), and also at age 16 adolescents are legally allowed to live without guardians. Like those in most of the UK, Peterborough pupils leave primary education and start secondary school in the school year they turn 12. This often represents some degree of step-change in autonomy; for example, many children travel by bus or walk moderate distances to secondary school by themselves. Legally children must stay in education until they turn 16, though almost all stay on at school past their 16th birthday to complete qualifications at the end of the school year. After this point, many leave education and adolescent lifestyles begin to diverge much more dramatically (Wikström, Treiber, et al., Forthcoming). For example, at age 16 the occupation of PADS+ participants was still very homogenous. Only 2% of participants were not in full time education (half had either been permanently excluded or were permanently not attending, and half were still attending school part time). The rest (99%) were in full time education (94% school, 5% alternative education units). Just one year later, by age 17, only three-quarters of participants were still in any form of education (7% of whom were studying part time, and 42% of those in education also had a part time job); 11% were in full or part time work, 5% were otherwise occupied (e.g., in the forces, parenting, volunteering) and 9% were not in any form of education, employment or training (NEET). This divergence continues into young

adulthood and is marked and driven by legal allowances on smoking, sex, driving motorbikes and then cars, and, if still in formal education, being able to attend university.

There are more specifically conceptual and practical complications for the analysis of parental monitoring as adolescents age. Whether parents or other guardians are present, or whether adolescents think their parents have knowledge of the circumstances of activity when they are not, may mean very different things for behavioural outcomes in early adolescence compared to young adulthood. For example, whilst the absence of parents or other guardians is a major feature of criminogenic exposure during adolescence (e.g., age 13-17; see Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012); parental presence ceases to have this effect in young adulthood. Analysis of change using PADS+ data shows that trajectories of criminogenic exposure best predict trajectories of crime when the supervision element is removed after age 17 (Wikström, Treiber, et al., Forthcoming). The potential for a difference in the meaning and influence of unsupervised time may be particularly apparent when the young person is no longer living with their parent(s) or any other guardian. In the UK, young people are legally allowed to leave home at age 16. By age 17, 3.6% (25) of the remaining PADS+ sample were not living with any guardian. They were instead living in hostels or social accommodation, living with a sibling, partner, friend, or their own child, or living alone.[2] Change in the meaning and influence of features of parental monitoring over the course of adolescence and emerging adulthood is under-researched (Padilla-Walker et al., 2008) but is not tackled here.

Since such change is a potentially complicating factor in the situational analyses in part IV rather than a feature of interest to this thesis, the study period is limited to a period that is characterised by less change - when participants were aged 13-16. PADS+ boasts a particularly impressive retention rate during this data reference period. Only 7 (1.0%) of the 710 original participants were not taking part four years later.[3] Although still taking part in other elements of the study, a further 16 (2.3%) only took part in two or three of the four annual Space-Time Budget interviews due to having moved away from the city.[4] This minimal attrition was analysed and

[2] Some participants were already living without guardians by age 16, but the number is much smaller (n = 7; 1% of 695).

[3] One of these was not interviewed at age 16, but was subsequently regained into the PADS+ sample and interviewed the following year (at age 17, outside the study period). However, self-reported crime frequency data was collected retrospectively for the previous year, hence the sample size is one participant larger for the crime frequency variable (n = 704) than for all other variables (n = 703), both at age 16, and for any variables that sum data across years. Note that two other participants who did not take part at age 15 were regained and interviewed at age 16. Again, only crime frequency data was collected retrospectively. This means that for these three 'regained' participants, all data except questionnaire crime frequency is missing for one year, and therefore these participants fall out of analysis using any other variables for those years, or analyses that sum data across years.

[4] Seven participants only completed the first two STB interviews, and a further nine participants missed the last STB interview.

there are no concerns about the implications for the quality of the already representative sample (Wikström, Oberwittler, et al., 2012). Although possible with a longitudinal study, change over time will not be specifically analysed due focus of this thesis on situational processes.

8.2: Instruments and measures

> *"It does not strike with an analytical approach to collect data with a sledgehammer and to analyze them afterwards with the finest tools of the trade. An analytical criminology requires a balance between both"*
>
> (Pauwels et al., 2009, p. 151)

The PADS+ study was designed and carried out under the banner of the 'garbage in, garbage out' mantra. Accurate and useful findings require effective and meaningful analysis of good quality and appropriate measures.

Individual level measures of crime propensity, perceived parental knowledge and crime outcome (prevalence and frequency) are captured using the PADS+ annual young person's questionnaire (section 8.2.1:). These measures are used in traditional analyses in chapter 9. Hour level data is collected using the innovative PADS+ annual Space-Time Budget (STB) methodology (section 8.2.2:). The individual level data from the questionnaire can then be applied to the hours spent by that particular individual so that the hour level data represents situations, i.e., the convergence of particular features of individuals and environments (see chapter 7 for discussion of situational data). Chapter 10 analyses the crime outcome of convergent conditions of the presence or absence of guardians, perception of parental knowledge, and crime propensity at the hour (situation) level. In addition, for the purposes of the traditional individual level analyses presented in chapter 9, hours when no guardians are present (measured using the Space-Time Budget) are aggregated to the individual level, thus providing a count of hours each person has spent unsupervised during the STB reference period during that year. There follows the specifics of these instruments and measures.

8.2.1: Individual level measures

Crime frequency, crime propensity, and adolescent-perceived parental knowledge of the circumstances of unsupervised activity were collected annually at the individual level via the PADS+ young person's questionnaire.

8.2.1.1: Young persons' interviewer–led questionnaire

To maximise data quality and reduce missing data, the questionnaire was interviewer-led and administered to groups of four participants at a time, collecting information on a range of

individual characteristics and experiences (see further, Wikström, Oberwittler, et al., 2012, pp. 62-64). This meant that very few questions were not completed in error by a very small proportion of participants, and a therefore a simple imputation for such internally missing data was used (details for each variable below). These imputations have little or no effect on the overall results because there are so few, and therefore all analyses include these imputed values.

8.2.1.2: Crime frequency

The PADS+ questionnaire asks participants to self-report whether they had committed each of ten different types of crime during the last year, and, if so, the number of times they have done so.[5] The exact wording of the both the questionnaire text for each item and the verbal instructions provided by the interviewer to each small group completing the questionnaire are reproduced in Wikström, Oberwittler, et al. (2012, pp. 111-113). The crime types included are shoplifting, theft from a person, residential burglary, non-residential burglary, theft from a car, theft of a car, vandalism, arson, assault, and robbery from a person.

Precise recall and honesty on the part of participants is crucial to the accuracy and representativeness of self-report data, particularly data about sensitive topics such as offending (see, e.g., Thornberry & Krohn, 2000). Wikström, Oberwittler, et al. (2012) report extensively on the ways in which PADS+ research staff "made a concerted effort to create trust and ensure anonymity… and… took measures to facilitate accurate recall as much as possible" (p. 109) in order to achieve reliable and accurate data.[6] Their analysis shows that the findings regarding self reported crime in the PADS+ study are in line with both previous research generally, and police recorded crime data for the same individuals (Wikström, Oberwittler, et al., 2012). For general discussions of the benefits and drawbacks of different sources of data on capturing crime involvement, see Hindelang, Hirschi, and Weis (1981); Hood and Sparks (1970) and Wikström, Oberwittler, et al. (2012). Due to extensive checks made in the field (for detail, see Wikström, Oberwittler, et al., 2012, p. 85), there is no missing data for any questionnaire crime frequency items collected during the study period.

[5] This means, for example, that the self-reported crime frequency data collected during the 2004 interviews (most of which took place in the first few months of the year) when participants were either already 13 or turning 13 (labelled 'age 13' in this study) refer to crimes committed in the calendar year 2003, when participants were turning 12. See further Wikström, Oberwittler, et al. (2012, pp. 129-131).

[6] Analyses in the book 'Breaking Rules' (Wikström, Oberwittler, et al., 2012) use the same self-reported crime data as this thesis, but also include data for when participants were 17.

The overall crime frequency measure used in this study sums the frequencies that participants self-reported for all 10 crime types. This approach to the same data is also taken by Wikström, Oberwittler, et al. (2012), who find no particular specialization by crime type across the sample. Although the participant's police records collected by PADS+ do record some crimes not included in the PADS+ questionnaire (public disorder, harassment and breaches of previous sanctions), comparison of self-reported and police recorded crime data shows that the 10 crime types generally represent the overall variation of adolescent offending (Wikström, Oberwittler, et al., 2012). Whilst relative variation between people may well be captured by police-recorded crime data, it is clear not least from the problem of the 'dark figure' encountered with official crime records that a self-report methodology can more accurately estimate the *absolute* magnitude of crime involvement (Wikström, Oberwittler, et al., 2012). The exact number of crimes reported on the questionnaire is likely to involve some level of imprecision, and should be interpreted accordingly. However, this free response method results in a more specific and therefore accurate measure of the order of magnitude when combining crime types than is created by summing multiple categorical measures of frequency, particularly if the categories are wide, or unlimited (e.g., 10+, 150+). In particular, allowing a free response for crime frequency avoids a false ceiling effect which is created either when the upper bound of crime frequency is capped or unknown. Far from being problematic outliers, very high frequency offenders may provide crucial data variation that allows complex relationships to become apparent in sensitive analyses.

Since this study focuses on situational processes rather than processes of stability and change, for all individual level analyses (chapter 9) the four annual self-reported crime frequencies are summed (see also section 8.3.3.1:). The summing procedure means that any participant who did not complete all four interviews in the study period is not included in analyses that use the summed variable; however, sample attrition is so low (n = 7) that this is not a problem.[7] Correlations between annual self-reported crime frequency measures are significant and moderate to strong (coefficients range from .35 to .66; p = .000; n ranges from 704 to 707) (Wikström, Oberwittler, et al., 2012, pp. 116-117). Correlations are higher between the most proximal years, suggesting some trend in change over time. Wikström, Oberwittler, et al. (2012) analyse the same crime frequency data as this study and show that, overall, offending increases year on year between the ages 13-16, but that this change is driven by an increasing concentration of offending in a small group of high frequency persistent offenders (crime prevalence begins to decrease after age 14) (Wikström, Oberwittler, et al., 2012, p. 128). Changes in crime involvement

[7] See footnote 3 for details of a specific complexity regarding the sample size for the self-reported crime frequency variable.

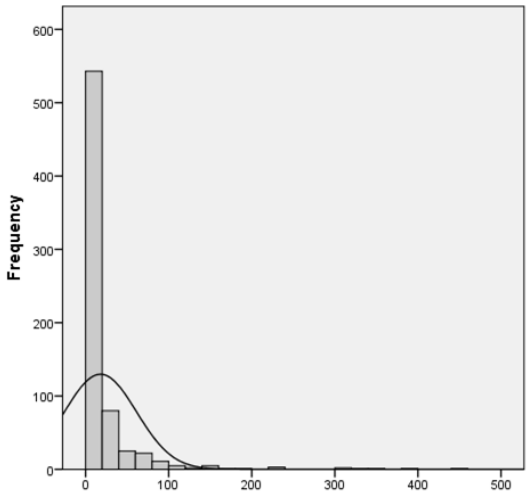
over time will not be further studied in this thesis; instead the focus is on situational explanations of total age 13-16 crime frequency (dependent variable).

There are indeed a small number of offenders who offend very frequently during the period that they are 13-16. For example, just 8.3% of offenders (n = 40; each reported more than 70 crimes) were together responsible for exactly half of all the crimes reported by the whole sample during the period. The most frequent offender self reported 453 crimes during the period, about 2.2 crimes, on average, per week. However, there are also a large group who do not report any offending at all (n = 220; 31.3%),[8] and most offenders reported only a very small number of crimes (modal average = 1; 29.1% of offenders reported 3 or less crimes). This leads to a highly skewed distribution of crime frequency (Table 6 and Figure 7). As discussed in section 7.2:, a zero-inflated negative-binomial distribution such as this is very problematic for the kinds of individual level analyses presented in chapter 9. The skewness of this dependent variable is strong enough to be not much improved by log transformation (Table 6).

Table 6: Descriptive statistics: Total self-reported crime frequency age 13-16

	n	**Range**	**Mean** ***(std. error)***	**Std. Deviation**	**Skewness** ***(std. error)***
Crime frequency	704	453	17.90 *(1.63)*	43.29	5.50 *(.092)*
Crime frequency (logged)	704	2.66	.726 *(.025)*	.668	.534 *(.092)*

Figure 7: Distribution histogram: Total self-reported crime frequency age 13-16 (*n* = 704; unlogged)



[8] A dichotomised crime prevalence variable was created for the purposes of logistic regression analyses in section 9.2.1:.

The sample was responsible for a considerable volume of 12,603 crimes between the ages of 13-16, of which the majority (70.0%) were acts of assault, shoplifting, or vandalism. To confirm the appropriateness of self-report rather than police recorded data for measures of absolute crime frequency, data taken from Wikström, Oberwittler, et al. (2012) shows that the same participants received police sanctions for only 67 crimes during the same period (p. 122; Table 3.10), meaning that police records refer to only one in every 188 crimes self-reported by the sample between the ages of 13-16. For extensive description and analysis of offending by the PADS+ sample, see Wikström, Oberwittler, et al. (2012).

8.2.1.3: Crime propensity

The index measure of individual crime propensity is made up of generalised personal moral rules and generalised ability to exercise self control. These scales have been used extensively elsewhere to test SAT. Items are listed in section 12.2: in the appendix. For further details and descriptive statistics for these items and scales, see Wikström, Oberwittler, et al. (2012, pp. 132-137).

Generalised personal moral rules were measured annually using a scale of 16 items asking how wrong participants felt it would be for a person of their age to do a range of behaviours. The full moral rules scale from the PADS+ questionnaire is reproduced in Table 24 in section 12.2: of the appendix. Items include minor and serious moral infractions (including crimes) and substance use. Item responses were summed and scale alphas were .89, .90, .88, and .89 for ages 13-16 respectively. Participants' perceived wrongfulness of the items ranged in expected ways depending on the seriousness of the item, and decreased by age (particularly for minor moral infractions and substance use), though the items were generally perceived as 'wrong' - for example, the mean item score for the scale decreased from 2.27 at age 13 to 1.84 at age 16 (0 = Not wrong at all, 1 = A little wrong, 2 = Wrong, 3 = Very wrong) (see further, Wikström, Oberwittler, et al., 2012).

A generalised ability to exercise self control was measured annually using a scale of eight items measuring how much participants agreed with statements about themselves. Items tap general impulsivity, risk-taking, and future orientation which are assumed to affect a person's ability to exercise self control (Wikström, Oberwittler, et al., 2012). For the full scale, see Table 25 in section 12.2: of the appendix. SAT defines the ability to exercise self control as a persons' ability to "abide by his or her own moral rules when externally pressured to break them" (Wikström, Oberwittler, et al., 2012, p. 137). (Dis)agreement with the statements was coded and summed so that higher scores denoted a poorer ability to exercise self control. Scale alphas were .78, .76, .78

and .77 from age 13-16 respectively. The responses to this scale showed "remarkable stability by age" (Wikström, Oberwittler, et al., 2012, p. 137).

High crime propensity comprises weak moral rules and a poor ability to exercise self control. Annual scores on the moral rules scale were recoded so that higher scores denote weak moral rules, and were then standardised across the sample. The poor ability to exercise self control scores were also standardised and then added to the recoded weak moral rules scores. This final score was standardised again to give an annual (z-score) measure of individual crime propensity.[9] There are just seven participants missing propensity scores, all at age 13. This is due to missing more than two items on the subscales.[10] In each year (and also overall, see Figure 8), the individual crime propensity score is approximately normally distributed. Individuals were classified as high, medium, or low propensity each year, as determined by boundaries +/- one standard deviation from the mean. Across all four years, this equates to 14-16% of participants being classified as extreme high propensity and a corresponding 14-16% classified as extreme low propensity, with the remaining majority (66-70%) of participants being categorised as medium propensity annually. As pointed out by Wikström, Oberwittler, et al. (2012) who also used this classification method, these groups are designed to help illustrate important differences between young people with different crime propensities and as such are defined using arbitrary boundaries. Some analyses in chapter 10 also use a less extreme categorisation of crime propensity whereby two groups are defined as above or below the mean. This results in 46-47% of participants being classified as high propensity annually.

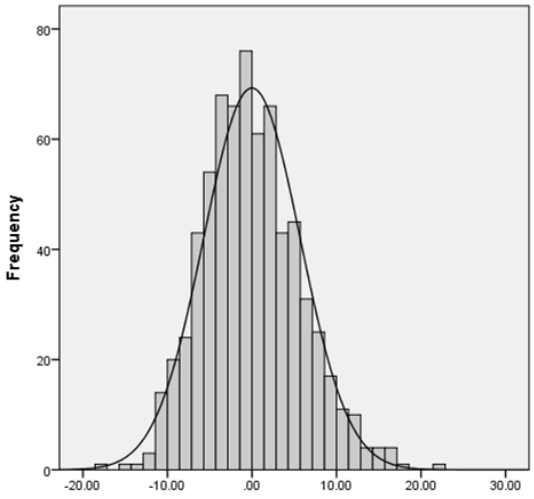
Crime propensity gradually increases slightly during the period captured by this study, which is largely driven by a relaxing of attitudes to minor moral infractions and substance use during adolescence (Wikström, Oberwittler, et al., 2012). In the short term however, generalised crime propensity is a relatively stable individual characteristic that would not be expected to fluctuate over sort periods. It does not change much even year to year - zero order correlations for crime propensity by age range from .54 to .72 (p = .000; n = 696-703) depending on the collection age of the scores being correlated, with strongest coefficients between most proximal ages.

[9] This study does not aim to study the components of the perception choice process. Instead it aims to capture relationships that are consistent (or not) with what would be expected if the process operates as proposed. This means that the separate components of personal morality and ability to exercise self control are combined into a composite measure of crime propensity for the analyses in this study.

[10] A regression method was used for the imputation of missing data for up to two items each on the morality or self control scale. However, imputations were minimal. Excepting the self control scale at age 13 which required imputations in 32 cases, the maximum number of cases requiring imputations at any age on either scale was seven.

For most of the analyses in chapter 9, the annual crime propensity scores were summed to give a single crime propensity score for each individual for the period they were age 13-16 (see also section 8.3.3.1:). This overall score was normally distributed (Figure 8) and individuals were grouped using the same method as the annual measures (15.4% = low crime propensity; 68.7% = medium propensity; 15.9% = high crime propensity).

Figure 8: Distribution histogram: Individual crime propensity age 13-16 (n = 694) (unstandardised sum of annual standardised scores)



8.2.1.4: Adolescent-perceived poor parental knowledge

In this study of the situational process leading to acts of crime, parental knowledge is conceived of as a measure of psychological presence (for a discussion of the varied meanings and operationalisations of parental knowledge, see chapter 4). When unsupervised, the adolescent's perception that their parents know the details and circumstances of their activities is proposed as a way in which absent parents can be psychologically present in settings and, as when physically present, influence the moral context of that setting (chapter 6). This psychological presence is captured, in part, by a measure of adolescent-perceived parental knowledge. This measure captures adolescent perceptions of the general level of their parent's knowledge about their activities, whereabouts and companions when they are unsupervised.

Adolescent-perceived parental knowledge was measured annually (age 13-16) using a scale of three items asking participants about generally how often their parents know about their activities, whereabouts and companions (summarised as what, where and who) when they are unsupervised (i.e., out and about by themselves or with friends). The PADS+ questionnaire items for the parental knowledge scale are reproduced in Table 26 in section 12.2: of the appendix. Of the 8,469 total possible data points for these three questions put to the sample in

each of four annual questionnaires, there were only six (0.07%) data points missing, all at age 13. In these cases, scores were imputed from the mean of the other item scores. There are therefore no missing cases on the parental knowledge scale.

Perceived parental knowledge frequency response options for the three items (what, where, who) were coded and summed so that higher scores denote perceived poorer parental knowledge (e.g., 'Yes, always' scored 0 and 'No, never' scored 3, giving a possible score range of 0-9 for each year). This means that the measure captures perceived poor parental knowledge. Although perceptions of the level of parental knowledge about what adolescents are doing was consistently slightly poorer than perceptions of where they were or who they were with, this difference is small. Cronbach's α for the scale were a very respectable .77, .83, .82 and .84 at ages 13-16 respectively. As implied by high reliability for a short scale, the three elements inter-correlate strongly in each year (coefficients not shown). Participants also showed a general tendency each year to report the same level of perception of parental knowledge for each element of knowledge (what, where, who).[11]

The resulting four annual measures of perceived generalised parental knowledge reflect key variation among adolescents in their perceptions of the level of knowledge their parents had of the circumstances of their discretionary (unsupervised) time over the period. Whilst on average adolescents perceive their parents to have knowledge about the circumstances of their discretionary activity 'most of the time', participants vary in the level of parental knowledge they perceive. The standard deviation of the scores is more than one third of the mean in all years except at age 13, with the whole range of possible scores (no knowledge any of the time, ranging to complete knowledge all of the time) featuring every year. As might be expected (see section 4.3.2:), the level of perceived parental knowledge does decrease by age.[12] However, despite this change over time, the zero-order correlations between the annual perceived poor parental knowledge scores are still moderate to strong - coefficients range from .40-.62 (p = .000; n = 701-707). The trend towards perceiving less parental knowledge by age means that a slight skew in the distribution towards perceived good knowledge at age 13 becomes more normally distributed over time. Individuals were classified annually by their perception of good, medium, or poor parental knowledge as determined by boundaries +/- one standard deviation from the mean.

[11] This is reflected in the concentration of scores that are multiples of three. On average over the four years, 44% of participants each year scored the level of the three (what, where, who) elements of their parents knowledge the same. This effect is amplified by the summing of the four scores (see below).

[12] Paired samples t-tests show all decreases in mean score between all waves are significant (p=.000). Differences are bigger in earlier waves. The strongest zero-order correlation coefficients are for correlations between the most proximal ages.

Across all four years, this equates to 15-22% of participants being classified as perceiving poor parental knowledge, 20-25% good, and a 56-63% middle group being categorised as perceiving medium parental knowledge annually. Analyses in chapter 10 also use a less extreme categorisation of perceived parental knowledge whereby two groups are defined as above or below the mean. This results in 41-52% of participants being classified as generally perceiving poor parental knowledge annually.[13]

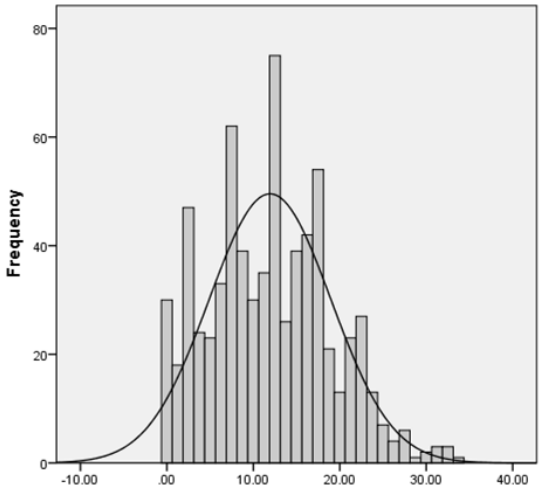
The four annual perceived poor parental knowledge scores were summed and assumed to represent a generalised measure of perceived poor parental knowledge for the period when participants were age 13-16 (see also, section 8.3.3.1:). The scale demonstrates a very good reliability regardless of the way in which the items are summed.[14] The scale has possible score range of 0-36. A score of zero means the adolescent has reported that their parents generally always knew where they were, who they were with and what they were doing during the whole period they were 13-16 (perceived good parental knowledge). By contrast, a score of 36 would mean that adolescents felt that their parents generally never had any knowledge at any time in this period (perceived poor parental knowledge), though the highest score reported was 34. The summed perceived poor parental knowledge score is slightly skewed towards adolescents perceiving that their parents know more about the circumstances of their child's activity than less (Figure 9) which is driven by the tendency for adolescents to perceive their parents to have more knowledge when participants were younger, but is otherwise fairly normally distributed.[15]

[13] Note that the wider variation in the proportions of these annual groups compared to the crime propensity groups reflects the slight change in distribution of perceived parental knowledge over time.

[14] For example, when the three items for each of four years are summed in one step, the 12 item scale has a Cronbach's α of .82. When the knowledge elements (what, where, who) for each year are summed in a separate first step then combined for a combined perceived knowledge scale, the resultant three item scale has a Cronbach's α of .90.

[15] Descriptive statistics, frequency distributions and Q-plots (not shown) show that perceived parental knowledge is not normally distributed at age 13 and also quite skewed at age 14, though also suggest that the scores at age 15 and 16 and the combined age 13-16 score are more normally distributed. The Kolmogorov-Smirnov test (not shown) is significant for all these variables, initially suggesting that the distributions deviate from a comparable normal distribution. However, in the light of the other evidence, this is possibly because such tests often highlight small deviations from normality in large sample sizes (Field, 2009).

Figure 9: Distribution histogram and descriptive statistics: Perceived poor parental knowledge age 13-16



N	701
Mean (SE)	11.93 (.27)
Standard deviation	7.06
Median	24
Mode	20
Range	0-34
Skewness (SE)	.31 (.09)
Kurtosis (SE)	-.36 (.18)

The kinds of individual level scale measures constructed from questionnaire data will be familiar to researchers working with social science data. The following section introduces a different kind of data that represents a departure from traditional individual level measures, and requires different data structures and analytical tools. As discussed in chapter 7, the distinction between these two kinds of data and analyses they afford is often underappreciated, misunderstood or entirely missed, but is crucial to appreciation of the unique contribution of this study.

8.2.2: Hour level measures

To conduct situational analysis to truly test person-environment interactions, data must represent person and environment *convergence* in time and space (chapter 7). Therefore the demands of the testable implications of SAT led to the development of a methodology capable of capturing situations. The result is the PADS+ study, where the innovative Space-Time Budget (STB) is central to the empirical insights afforded by the unique design of the study (Wikström, Oberwittler, et al., 2012; Wikström, Treiber, et al., 2012). The hours captured by the STB are the unit of analysis for the situational analyses in this study (see section 7.3:). The volume of data is large. For the period when participants were 13-16, the STB provides 268,800 hours of data; 167,420 (62.28%) of which were spent awake and are therefore used for analysis.[16]

[16] People are not able to access external features of a setting with their senses and therefore be influenced by them in the same way when they are asleep. Therefore, while they are asleep, individuals cannot be rationally quantified as being exposed to any particular social settings (Wikström, Oberwittler, et al., 2012, p. 257). These hours spent asleep are therefore not of interest to a study that places importance on the role of the social environment.

8.2.2.1: The Space-Time Budget methodology

> *"Another positive change in research on parenting and adolescent problem behaviour would be the use of new research tools"*
>
> (Kerr, Stattin, et al., 2008a, p. 4)

Time use diaries and even space-time diaries are not a new methodology (for a discussion, see, Hoeben, Bernasco, Weerman, Pauwels, & van Halem, 2014; Wikström, Oberwittler, et al., 2012; Wikström, Treiber, et al., 2012). Riley (1987) applied an early time diary methodology in criminology, however a more comprehensive time-diary that also included a spatial element was first developed for criminology by PADS+ (and its pilot study, see, Wikström & Butterworth, 2006). To date, PADS+ has utilised this Space-Time Budget (STB) methodology for over a decade in eight separate data collection waves. The PADS+ STB is labour-intensive, costly, and challenging to administer (Wikström, Treiber, et al., 2012), yet the benefits of the methodology mean that an increasing number of international studies are currently replicating the specific PADS+ STB methodology.[17] The PADS+ STB contributes to the recent consideration and development of innovative methodologies that aim to capture individuals' exposure to environments (within and without criminology; e.g., Basta et al., 2010; Browning & Soller, 2014; Chaix et al., 2012; Gesler & Albert, 2000; Humphreys et al., 2016; Perchoux et al., 2013; Schönfelder & Axhausen, 2003; Wiebe et al., 2014). In comparison to these other time use diaries and other methods designed to capture exposure to environments, the particular focus of the design of the PADS+ STB is the requirement to capture the convergence of particular kinds of people in particular kinds of settings in order to study situational interaction (see further, chapter 7). Only the STB data collected by PADS+ has so far been used to study situational interaction – the purpose for which it was designed and is almost uniquely capable (see further section 7.3.1:).

The STB method gathers information on the settings encountered in participants' everyday lives, and on aspects of their behavioural response in those settings. The STB interview captures the details, hour by hour, of four recent days, amounting to 96 hours per participant annually.[18] The nature of this specialist intensive one-to-one interview and the benefits it affords in terms of recall and reliability over other diary methods (such as self-completion) are described in detail by Wikström, Oberwittler, et al. (2012, pp. 76-78) and also Wikström, Treiber, et al. (2012). Various

[17] The particular PADS+ STB has so far been partially or fully replicated in The Netherlands, Sweden, Slovenia and Canada.

[18] Capturing four days is sufficient to represent young people's general activity patterns and personal variation (Stewart, 2006; Stinson, 2000; Wikström & Butterworth, 2006; Wikström, Oberwittler, et al., 2012). Additionally, limiting the burden of a longer interview can help maintain response rates (Anderson, 1971; Gershuny et al., 1986; Harms & Gershuny, 2009) and asking about more recent days may help with participant recall (Wikström, Oberwittler, et al., 2012).

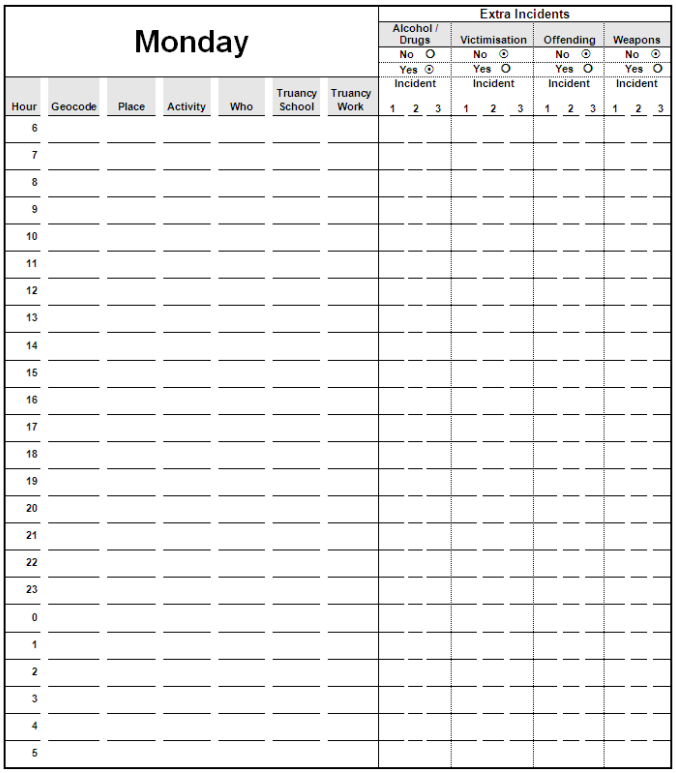
data quality measures taken by PADS+ are described in Wikström, Oberwittler, et al. (2012, pp. 82-87). The rigorousness and effectiveness of the data collection method and protocols resulted in high quality data and virtually no missing data. Wikström, Oberwittler, et al. (2012) present analyses that validate the PADS+ STB data in various ways by comparison with data from other sources, including those external to PADS+.[19]

Specialist researchers code what the person was doing, who they were with, where they were (functional place) and geographical location for each hour (for the majority of that hour). The specificity of this coding is apparent from the huge number of codes used to record the STB interview, particularly since the codes for each domain can be used in myriad combinations (for a list of codes, see, Wikström, Oberwittler, et al., 2012, pp. 423-436). Hours represent the most appropriate unit of time for this kind of research because they capture the diversity of activities and places in adolescent time use, while simultaneously representing the main features of their activities and movements. Some activities either take less than the majority of one hour or are secondary activities and therefore may not be captured by this method. However, certain of these short or additional activities are of prime interest to PADS+, so the STB also records details of particular additional incidents taking place each hour such as crimes, victimisations, risk events, weapons carrying and substance use.[20] Figure 10 shows the PADS+ STB data entry form (for one day only) that is completed in the field by PADS+ trained researchers during the one-to-one annual interview.

[19] For further methodological validation analyses using STB data from the SPAN study (which replicates the PADS+ STB methodology), see Hoeben et al. (2014).

[20] The STB methodology captures only a short four day period of activity and records this activity in hour units. It is not designed to accurately capture short and rare events such as crime, but to capture the (situational) conditions under which acts of crime occur, and also the conditions under which acts of crime don't occur. Assessing the effectiveness of the STB method for capturing short and rare events (see, Van Halem, Hoeben, Bernasco, & Ter Bogt, 2016) is akin to assessing the suitability of the use of a hammer to clean a window whilst ignoring its perfectly designed ability to hammer nails into wood, and that there already exist many other much more suitable and commonly used methods for cleaning a window.

Figure 10: PADS+ STB entry form (single day)



The STB method affords two major benefits. Firstly, the STB represents a much richer method than traditional methods for capturing exposure and time use. Most traditional (individual level) measures of exposure rely on broad and more subjective time use questionnaire measures capturing for example 'how many times a week', or 'how often' a person reports they are 'exposed' or doing a particular activity. Although these measures are inexpensive and replicable, they suffer problems with recall and reliability, and are much more limited in scope. For a discussion of the superiority of the time diary method in obtaining valid and reliable data on activities, see (Belli, Alwin, & Stafford, 2009; Hoeben et al., 2014; Juster, 1985; Juster & Stafford, 1991; Marini & Shelton, 1993; Mulligan, Schneider, & Wolfe, 2005; Phipps & Vernon, 2009; Robinson, 1985; Stafford, 2009; Wikström, Oberwittler, et al., 2012; Wikström, Treiber, et al., 2012). By combining all features of the hour-level STB data for each hour, it is possible to make rich 'complex constructions' of setting features (Stafford, 2009), and thus quantify time-use, activities and exposure to the social environment much more accurately and specifically (Hoeben et al., 2014; Wikström, Oberwittler, et al., 2012; Wikström, Treiber, et al., 2012). By collecting temporally and spatially referenced data on activities and features of settings, STB data can be

used to test the central propositions of theories such as Routine Activity Theory (Cohen & Felson, 1979) and Crime Pattern Theory (Brantingham & Brantingham, 1993).[21]

The second and most innovative and unique benefit of the PADS+ STB is that it collects situational data (for a discussion of situational data and the analyses it affords, see chapter 7). The utility of STB data goes far beyond tests of the role of activities and exposure to particular setting features in crime because the STB was designed to test the key (interactive) propositions of SAT and therefore it captures the convergence of people in settings. STB hour level data on setting features can also be linked in time and space to other data sources (e.g., about the individual spending that hour and the features of the social and built environment) (Wikström, Treiber, et al., 2012). The STB is therefore able to capture whether or not a crime happens under the situational convergence particular conditions, i.e., when a particular individual (with particular characteristics measured by other PADS+ instruments such as the questionnaire) is in a particular setting (with particular characteristics captured by the STB and other data) at a particular time, place, and spatial location. Each STB hour captures a situation, about which a combination of PADS+ data affords a great deal.

8.2.2.2: Guardian status: The presence or absence of parents and other guardians

The presence or absence of parents and guardians is an aspect of exposure that the STB is well placed to capture. This is particularly true for the study of situational as opposed to developmental processes. Questionnaire measures of aggregated counts of supervised and unsupervised time during a time period (e.g., a year, as commonly applied in developmental research) are too unspecific to be suitable for the study of the influence of the presence of guardians in action contexts on acts of crime. In contrast, each hour of STB data records who was present.[22] The guardian presence status of the vast majority of STB hours was

[21] Hoeben et al. (2014) actually incorrectly suggest that the STB was designed to test routine activity theory (RAT), and in order to "illustrate the relevance of Space-Time Budget method (STB) for criminological research" (Hoeben et al., 2014, p. 8) they only cite studies that test the propositions of RAT and not those that test propositions about situational interaction. In so doing, this publication, which aims to report the role and impact of the STB in criminological research, underplays the importance of the almost unique ability of the STB to capture the convergence of particular people in particular settings (situations). Such situational data is crucial for situational analysis, and it is these kinds of analyses that justify the financial and temporal expense of obtaining situational STB data and really set aside integrative research from that which continues to fragment individual and environmental approaches (chapter 7). Distinctions between these kinds of analyses, kinds of data and kinds of approaches frustratingly often appear to be (dis)missed by readers and researchers (including users of the STB method).

[22] Whilst hour units may be suitable for this kind of study in general (see section 8.2.2.1:), they are not the optimal unit for capturing variation within an hour. Guardians may come and go from a setting and participants may move in and out of settings over the course of an hour meaning that whether guardians are present in the setting with the participant can vary throughout that hour. STB hour-level classification of the presence of guardians in a setting was based on whether guardians were present for the majority of the hour. This relatively slight imprecision is not particularly problematic for aggregated individual level measures of exposure (e.g., the number of hours a person spent unsupervised), but may be more problematic for situational analysis (e.g., of whether a crime occurred in the

straightforward and unequivocal; however there was some degree of discretion required and applied when coding the STB in the field, and the trained researchers were provided with strong guidelines and the opportunity to discuss specific coding ambiguities. Both these coding guidelines and the post-hoc classification of the measure of guardian status required specific definition of the terms 'presence' and 'guardian'.

Section 4.3.1: distinguished between presence and supervision, and crucially this measure of the presence of guardians does not assume supervision. The terminology of Routine Activity Theory assumes that to be effective, a guardian must be capable (and presumably perceived as such by the motivated offender) (Cohen & Felson, 1979); however, the level of and effect of these factors may vary independently of each other and of presence. This thesis aims to distinguish and assess only the effect of the presence of guardians in settings.

The concept of presence is defined in section 4.3.1:. At the hour level, the presence or absence of others was determined by whether they are in the same setting as the young person; where a setting is defined as the objects, persons, and events a person can access with their senses. (section 4.3.1:, see also Wikström (2006). For the presence or absence of a person to impact on action contexts and therefore potentially influence adolescent action, the person must be either physically with the adolescent (e.g., in the same room), or within view or earshot.

The term 'guardian' refers to both legal guardians and others who may be formally or informally charged with or assumed to have some level of (even nominal) responsibility for a young person (for a discussion of guardians and responsibility, see also, Clarke, 1992; Felson, 1995). This definition does not assume effective supervision. In the interests of presentation, this thesis uses the term 'parent' to refer to various kinds of legal guardians who are appointed to or have adopted the parental role, e.g., foster or adoptive parents and other legal guardians.[23] Other guardians (than parents and legal guardians) are any people present who are over age 18 (legal

presence of a guardian). For example, acts of crime are typically short in duration. If a guardian was not present for the entire hour during which an act of crime occurred, the crime may have occurred when the young person was unsupervised even though the hour is classified as having guardians present. An example of when such a misclassification may occur is when a short event (such as a fight) occurs when a teacher is out of the classroom for a short period of time, despite their presence for the majority of the lesson (hour). Some discretion was exercised by researchers though some inaccuracy will remain for situational analyses of this data. However, any such misclassification would anyway only lead to an underestimation of the role of guardians in the setting (Wikström, Oberwittler, et al., 2012, p. 279).

[23] No analysis of the differences or similarities between different kinds of legal guardians in neither their parental monitoring nor outcomes among their children is attempted in this thesis. Although there is research suggesting differences between different types of guardians, the level of discussion and analysis in this thesis applies broadly to all parental figures and roles. The argument presented here is about 'parenting' processes, and therefore discussions about specifically who fulfils the parental role and any effect that may have taps into a different kind of question that will not be dealt with in the present study.

adult), but excluding people who have no (even nominal) responsibility for young people in their presence. Examples of adults present in a setting who are not classified as a guardian include passersby (e.g., those also present in a cinema, café, park or on a street), adults with no specific responsibility (e.g., a bus driver or shopkeeper) or those over 18 but who are particularly not in a supervisory role, either at all or during that hour (e.g., older friends, siblings and partners)[24] - this latter exclusion was mostly relevant when participants were themselves older.

To create the measure of guardian status, STB hours were classified by i) whether a parent was present; ii) if the young person was in the presence of another adult guardian; or iii) if no guardians were present (the adolescent was unsupervised).[25] This categorical variable can be dichotomised into i) guardian(s) present and ii) unsupervised.

Table 7 shows that adolescents aged 13-16 were in the presence of at least one guardian most of the time they were awake.[26] This was most often a parent, but a great deal of time was also spent in the presence of other guardians. Other guardians were primarily teachers, parents of the participant's peers, other family adults (e.g., grandparent, aunt, uncle), and employers. At age 16, participants in the PADS+ study spent 32% of their awaken time in the presence of an adult who was not a parent or family member. Of this time, 72% was at school, 13% in another persons' home and 4% at work. Despite particular academic interest in the effects of unsupervised time, it is important to remember that in total adolescents unsupervised for only a fifth of the time they spent awake.[27]

[24] In some cases or at particular times older (18+) siblings were counted as guardians, for example, when they were specifically in a supervisory role (i.e., babysitting).
[25] Of the 167,420 hours spent awake by participants during the study period, information on whether a guardian was present was missing for such a small number of hours (44 hours, 0.003%) that these are ignored without fear of introducing bias. None of the hours during which crime took place are missing any data.
[26] This table reports proportions of STB hours. I.e., all participants over all waves reported about their level of supervision during 167,376 awaken hour units; nearly 80% of these total awaken hours were spent in the presence of a guardian. When aggregated to the individual level, guardian status varies (see section 8.3.2:).
[27] The proportion of young people's awaken time spent with a family adult slowly and steadily decreased as they aged (age 13, 50%; age 14, 48%; age 15, 46%; age 16, 44%). This is most likely due to changes in the social expectations placed on adolescents and their levels of autonomy (see sections 3.1: and 4.3.2:). This change over time (by age) represents a selection effect which will not be studied further in this thesis. Causes of the causes (such as selection) are not of direct interest to this situationally-focused study (see section 5.2:).

Table 7: Guardian status (total awake hours)

		N		%	
Guardian present	Parent(s)	78,403	132,959	46.9	79.4
	Other(s)	54,556		32.6	
Unsupervised		34,417		20.6	
Total		167,376		100.0	

8.2.2.3: Crime hours

Section 8.2.1.2: introduced the importance of reliability for the quality of self-reported measures of crime outcome, which is also crucial to the quality of STB data. The ways in which the one-to-one interview method facilitates accurate and honest reporting of crime during the days covered by the STB is described in Wikström, Oberwittler, et al. (2012), which also provides assurances as to the validity of the STB crime measure. In spite of considerable congruence between STB crime data and crime data from other sources (see, Wikström, Oberwittler, et al., 2012), it is important when assessing the quality of the STB self-reported crime data to bear in mind that the STB is not designed nor therefore suitable to study rare events and individual levels of crime involvement (see further section 8.2.2.1:, footnote 20 in particular).

Each hour of the STB records whether the participant reported offending during that hour. This means that STB crime is a binary outcome variable because it either does or doesn't happen in a particular hour. During the study period, participants reported 128 offences during a very small proportion of their hours spent awake (0.07%; 125 hours).[28] In line with other self-reported and police-recorded data sources for adolescents' offending in the UK, crime is rare in the STB data (for a discussion, see, Wikström, Oberwittler, et al., 2012). Also largely congruent with other self-reported UK data sources for offending by young people (Wikström, Oberwittler, et al., 2012), more than half the offences were acts of violence (n=67, 52.3%), nearly a third were acts of vandalism (n=38, 29.7%); and there were 10 thefts (7.8%), seven cases of shoplifting (4.7%) and six driving offences (4.7%) reported. Due to the rarity of crime, no crime-type specific analyses are conducted in this thesis.

[28] Participants reported 128 offences taking place within 125 hours because there were three hours when the respondent reported committing two distinct offences during the same hour. In two of these cases, the offences were both acts of vandalism. In the other hour, the participant reported an act of vandalism and a theft. For the purposes of the analyses conducted at the hour level in this thesis, the hours containing two crimes were duplicated so that the dataset contains n=128 crime hours.

8.3: Levels of analysis: Transforming data

Section 8.2: describes both individual and hour level measures. Whilst this thesis presents analyses at both the individual level (chapter 9) and the hour level (chapter 10), only a measure of crime outcome is captured at both levels. This means that some hour level data must be aggregated to the individual level, and some individual level data must be applied to the hour level.

8.3.1: Applying generalised individual-level measures to hours

Situational analysis calls for situational level data, and assesses the effect of convergent conditions irrespective of the source of those conditions (see further 7.3:). The STB captures situations in hour units. However, not all measures involved in the situational analysis are collected at the hour level because to do so is not feasible, and in some cases not necessary. In the situational analyses in chapter 10, annual measures of generalised crime propensity and generalised perceived parental knowledge captured for each individual are applied to the hour level STB data collected for that individual in that year. This means that although these individual level characteristics are analysed as hour level conditions in the situational analyses, the data on crime propensity and parental knowledge do not differentiate between STB hours collected within the same year.

In principle, moral rules and the ability to exercise self control are situational in that the perceived wrongfulness of a specific act (e.g., an act of theft or violence) may vary by circumstance (for example if the theft is committed in order to benefit another person or the act of violence is occurs in self defence or during a sports game); and reactions related to self-control may be different under different circumstances (for example because executive functions are influenced by factors such as alcohol, drugs, and extreme emotion). A measure of such situationally-specific crime propensity would require the lengthy addition of a complex retrospective assessment of hour-specific crime propensity to the STB. Such a measure is not only methodologically problematic but is arguably unnecessary. SAT argues that a *generalised* measure of individual crime propensity does not vary across situations and will be generally related to the probability that the individual will perceive and choose to carry out an act crime in response to a criminogenic setting.

> *"The assumption is that young people's generalised responses will have some relationship to how they would generally apply their morality (exercising moral habits or making moral judgements) and their ability to employ self-control (i.e., to manage conflicting rule-guidance) in specific situations"*
>
> (Wikström, Oberwittler, et al., 2012, p. 132).

Individual characteristics that are, or are assumed to be, stable across situations (such as a generalised measure of crime propensity) need only be collected at the individual level because they can be applied ad hoc to each hour in which a particular person takes part. However, in the case of many individual characteristics (as opposed to fixed attributes), stability is not a dichotomy. For example, generalised crime propensity might be expected to be relatively stable across situations, but changes gradually from year to year (see section 8.2.1.3:). For this reason, an annual measure of generalised propensity is applied to each hour only within that year.

Whilst an annual generalised measure of crime propensity is suitable for the empirical situational analyses in this thesis, the analyses would, however, benefit from a more situationally-specific measure of adolescent-perceived parental knowledge. Whilst crime propensity can vary situationally and can also change over time and vary by crime type, using a generalised measure of propensity arguably reduces the need for a situational measure. The same is less true of adolescent-perceived parental knowledge – adolescent perceptions of the general level of their parents knowledge of the circumstances of their unsupervised activities may not correspond closely to that perception hour by hour (unless they perceive their parents to either always or never know about the circumstances their unsupervised activities).

Dishion and McMahon state that "the exact recall time frame for parental monitoring should correspond with the goals of the research" (1998, p. 68) (see also, Shelton et al., 1996). Whilst this study of the situational role of parental monitoring arguably comes closer than any other, it only partially fulfils this goal. The STB affords a situationally specific measure of the presence of guardians that is crucial to the analysis of the situational role of the presence of guardians in settings, but sadly does not provide the same measure for perceived parental knowledge. Whilst the situational analyses in this thesis represent a major step-forward in the understanding of the situational role of parental monitoring features such as the presence of guardians and perceived parental knowledge, without an hour-specific measure of whether the participant thought that their parents knew the circumstances of their actions *during that particular hour*, these analyses are unfortunately partially limited in terms of the conclusions they afford about the situational role of perceived parental knowledge.

PADS+ was not specifically designed to study parental monitoring, or even parenting in general. Despite an exceptional breadth and depth of data collection, PADS+ cannot possibly be designed to capture data at the level of detail required for in-depth multi-level analysis of any specific topic among a plethora of wide-ranging phenomena in the study of crime-causation. Whilst the design of an STB that captures situation-specific perceived parental knowledge is not

implausible, this would need to be conducted within a specialist study (for example, of parental monitoring), which is unlikely to then be able to draw upon the kinds of data afforded by a large-scale longitudinal study such as PADS+.

8.3.2: Aggregating specific hour-level measures to individuals

Traditional analyses such as those presented in chapter 9 require measures at the individual level. For this purpose, the number of STB hours spent unsupervised (no guardians present) is aggregated to each individual for each year. Once summed over the entire period, this individual level aggregate shows that on average (per person), adolescents spend one fifth of their time awake unsupervised (20.46%);[29] a figure that is unsurprisingly similar to the hour-level measure (Table 7 on page 252). However, the relatively normal distribution of unsupervised time across individuals means that some adolescents are very rarely unsupervised (min. 0.09% of awaken time),[30] and some are unsupervised for a considerable proportion of their awake time (max. 63.56% of awaken time); though a slight positive skew means that actually only 10% of the sample were unsupervised for more than 31% of their time spent awake. How and why particular individuals come to have a particular pattern of exposure (in this case to being unsupervised) are questions relating to selection processes (see section 5.2.2:), which are not addressed in this thesis.

Analysis of the interrelation of variables at the individual level in chapter 9 requires the classification of individuals into groups based on their time spent unsupervised. As the skew in the distribution across individuals is only slight, the same method for creating groups of individuals is used as for generalised crime propensity and generalised perceived parental knowledge. Individuals were classified into groups representing a low, medium, or high number of hours spent unsupervised each year and across all years, as determined by boundaries +/- one standard deviation from the mean. Across all four years, 14.8% of participants were classified as having a low amount of unsupervised hours; 13.4% high; and 71.8% medium. These groups are designed to help illustrate important differences between adolescents with different amounts of exposure to being unsupervised, as opposed to define any particular 'tipping point' at which an amount of unsupervised exposure becomes more or less criminogenic, and as such these groups are defined using arbitrary boundaries (Wikström, Oberwittler, et al., 2012).

[29] Calculated as the total percent of time spent unsupervised *per person* during the study period aged 13-16, for those 687 participants who took part every year.
[30] This suggests there may be a group of individuals who spend most of their discretionary time at home or otherwise with parents, as speculated by Kerr et al. (2010).

8.3.3: Causal ordering and summary of measures

> *"Every cause takes a certain amount of time to have an effect. The amount of time may be so small as to appear instantaneous, or may be large"*
>
> (Collins & Graham, 2002, p. S86)

> *"The temporal design should be chosen in relation to characteristics of the phenomena being studied"*
>
> (Collins & Graham, 2002, p. S86)

> *"If the hypotheses driving the data analysis specify that the relation is assessed at the time of the effect, but the temporal design is such that the relation cannot be assessed near the time of the effect, then the model as fit may not correspond completely to the hypothesis specified. This can be considered a model misspecification"*
>
> (Collins & Graham, 2002, p. S93)

> *"SAT asserts that the causes of action, such as acts of crime, are situational… ideally we should aim to have data (measurements) of people's propensity, exposure and crimes that are as close as possible in time – preferably measured concurrently"*
>
> (Wikström, Mann, et al., 2018, in press)

Some researchers have stressed the importance of time-ordering of cause and effect when testing a causal hypothesis. For example, Farrington and Welsh (2006) state that risk factors must precede the outcome in order to be causal (see also Morizot & Kazemian, 2015). This importance rests on the implication that one feature of causation is an association between time-ordered variables. This association occurs regularly and holds universally and therefore allows us to predict the effect from the cause. However, Wikstrom et al. suggest that this importance of causal-ordering for causality is perhaps overstated because it is not sufficient for (and is only one of) the prerequisites for establishing causality:

> *"The idea of causation is not only the idea of a regular association (and the possibility of prediction) but, crucially, also the idea that the cause in some way produces the effect through a causal process that links the cause to the effect"*
>
> (Wikström, Mann, et al., 2018, in press).

When testing a causal hypothesis it is important to consider the nature of the casual process (mechanism), and match this to considerations of causal ordering (see further, e.g., Bunge, 2004; Psillos, 2002)).

Often, aforementioned discussions about the importance of causal-ordering and measurement spacing take place within the context of developmental research, where data from longitudinal research designs with perhaps annual data collection might best suit the causal processes at

work.[31] Researchers who are either explicitly or implicitly interested in developmental processes have stated or implied that longitudinal studies are always preferable to cross-sectional studies when attempting to establish causality (e.g., Farrington, 2010, 2011; Walters & Mandracchia, 2017). However, this thesis focuses instead on situational processes and it would be inappropriate to apply much of this developmentally focused discussion on causal ordering to situational analysis. Instead, the nature of the phenomena and process under study should guide data collection and analysis because it determines the appropriate causal ordering and spacing of measurements of the characteristics of interest (P. Cohen, 1991; Collins & Graham, 2002).

The relevant causal time-ordering in situational analysis is between the interaction inherent in the situation (the cause) and the action, including acts of crime (the effect). Firstly, there is no relevant causal time-ordering between propensity and exposure because it is their *concurrent* interaction (giving rise to situations) that is relevant for action. Secondly, the causal situational process leading to action takes place over minutes and even (split) seconds, and time-ordered measurement of this process is practically very difficult. Experiments are perhaps the only way that these very fast-paced processes may be captured in true causal order. However, such experiments would most likely need to take place under unnatural laboratory conditions and therefore would be far from an ideal test of natural interactions and actions. Instead, causal factors should be measured at the time that they exert their causal influence (P. Cohen, 1991). This means that when conducting situational analysis, real-world measurements of propensity, exposure and crime should take place as close in time to each other as possible. In practical terms, this means these measures are ideally taken simultaneously. (For specific discussion of causal time-ordering in situational analysis, see also, Pauwels, 2018, in press; Wikström, Mann, et al., 2018, in press).

In sum, causal factors should be measured at the time they exert their influence (P. Cohen, 1991) and situational causal processes generally take place over very short periods of time (Wikström, Mann, et al., 2018, in press). Taken together the implication of these facts means that when conducting situational analysis, to avoid model misspecification (Collins & Graham, 2002) a design whereby measures are taken close together in time but may violate seemingly important causal ordering may be preferable to a design that obeys the temporal order of cause before effect, but captures temporally distal measures. In short, whilst establishing a plausible causal ordering is desirable, matching the relative data reference periods to the nature of the process under study is preferable. These two approaches to study design are depicted in the top row of

[31] For example, when studying the causes of the causes of crime (e.g., why and how individuals have developed particular crime propensities, see sections 2.4: and 5.2:).

the three rows in Figure 11 (compare the classical 'cause before effect' approach, left, to the 'cause simultaneous to effect' approach, right, that is more suited to the analysis of situational processes).

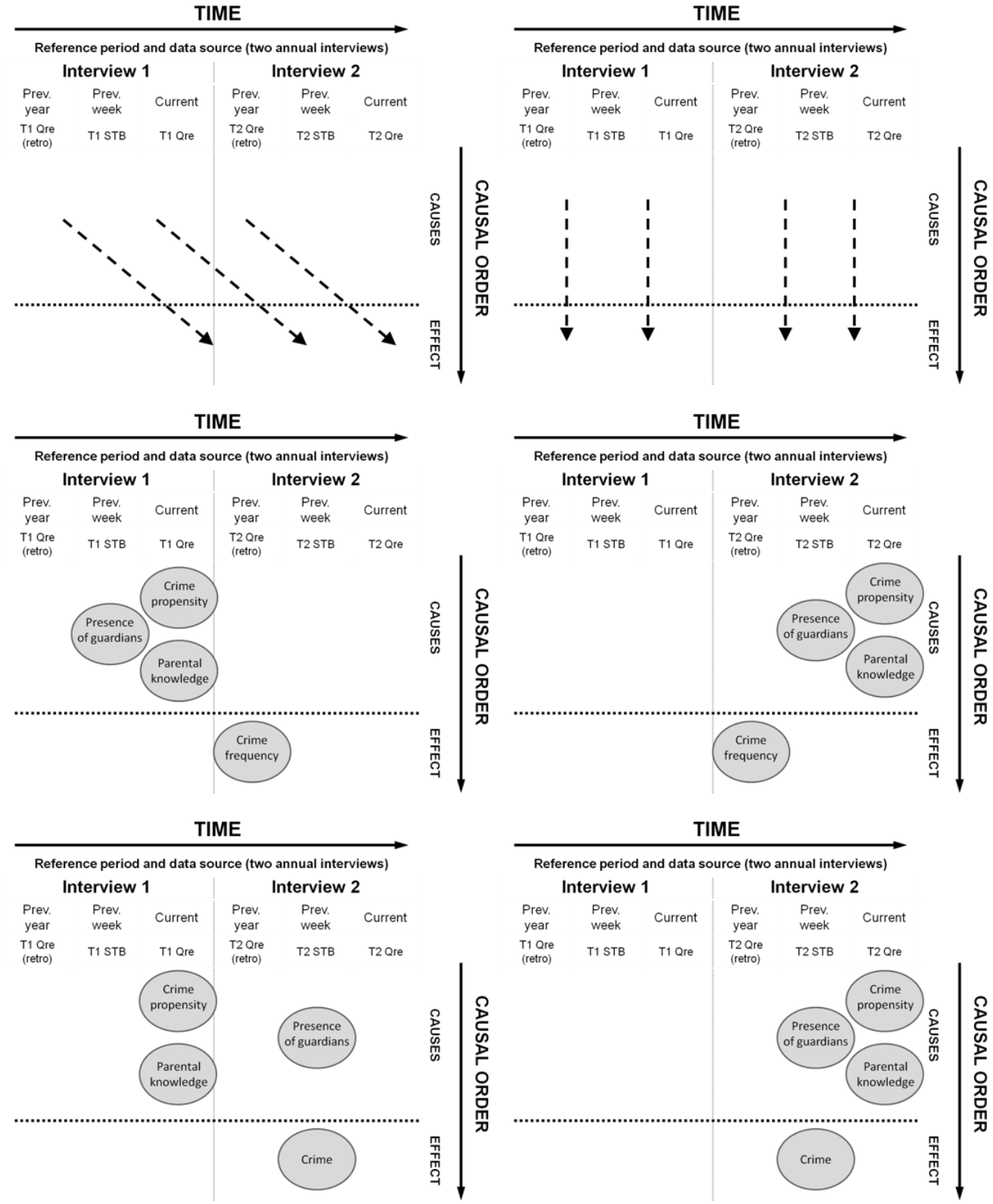
Further, depending on the various timing of particular measures, a reversal of plausible causal ordering may even be preferable when studying situational processes. For example, it may be better to have a model that contains a cause that is measured slightly after the effect, than an effect that is measured a long time after a theoretically momentary cause. Even if strict causal ordering is violated, proximity of measurement and plausible theoretical assumption mean that conclusions regarding causality may still be drawn. The analyses conducted in chapter 10 of this thesis this study are a practical application of this principle.

As described in section 8.2:, PADS+ collects a range of data at different levels. The individual-level and hour-level measures were collected annually during a single meeting via an interviewer-led questionnaire and a space-time budget instrument used during a one-to-one interview. Therefore the hour-level measures captured in the STB (i.e., presence of guardians and occurrence of acts of crime) refer to days during the week prior to the interview, and the questionnaire measures both generalised individual level *current* characteristics (i.e., crime propensity and perceived parental knowledge; captured within a maximum of 7 days of the first reported hour of the STB data), and retrospective self-report measures of behaviour that occurred over the previous year (i.e., crime frequency).

The individual-level and situational-level analyses in chapters 9 and 10 respectively use data at different levels which require different consideration of causal ordering. Figure 11 shows six study designs. For simplicity, only two years of data collection are included in each of these depictions. Each design depicts the data source, reference period, and causal ordering for theoretical depictions (top row), and also includes actual measures for individual-level analyses (middle row) and hour-level analyses (bottom row). The representations on the left of Figure 11 show designs where measures of causes precede measures of effects (desirable), regardless of the length of time between data reference periods; whereas the representations on the right depict designs where the data reference period is matched as closely as possible to the nature of the situational process under study (preferable), even if this means violating the desirable causal order.

Figure 11: Summary of measures and causal ordering

Left: *cause before effect (desirable);* ***Right:*** *data reference period matched to the nature of the situational process.*
Top row: *theoretical approach;* ***Middle:*** *individual level analyses;* ***Bottom:*** *situational level analyses.*



8.3.3.1: Individual level

The actual study design and approach to causal ordering used for some of the individual level analyses in chapter 9 is depicted in the middle right graph of Figure 11 (though variables are summed age 13-16 for some the analyses in chapter 9. See further, footnote 32 in chapter 8). By contrast, the middle left (individual-level) study design in Figure 11 depicts measures of crime propensity, parental knowledge and the absence of guardians (the latter aggregated to the individual level) captured during one interview to predict a measure of crime captured at the next interview. This protects the order of cause before effect, but lagging the data like this means that data from one time point is effectively lost (see blank areas in the top left depiction in Figure 11). The alternative is to use measures that all come all from the same interview (middle right study design in Figure 11). This retains all data reference points for analysis. However, due to the reference periods of the data, this means that for each year, measures of crime propensity, parental knowledge and the absence of guardians (the latter aggregated to the individual level) predict a measure of crime that refers to the previous year, thus violating the cause before effect order. This violation of cause and effect is particularly large in the case of the summed data for age 13-16.[32]

Violation of the temporal order of cause and effect is not as problematic as it may seem because first, whilst the traditional level analyses are conducted at the individual level, this remains a study of situational processes, as opposed to processes of stability and change over time. This means that the violation of causal ordering is less meaningful when the causal processes take place over very short periods of time. Secondly, it makes sense to use current (or previous week) measures to predict the questionnaire retrospective crime frequency measure collected during the same interview for two reasons, i) it is quite probable that participants are biased towards reporting their current level of crime frequency rather than that of up to a year or more ago (Wikström, Oberwittler, et al., 2012, p. 131), and ii) the measures of relatively stable generalised features such as crime propensity and parental knowledge arguably refer to a period of time (leading up to the interview) rather than just the moment of the interview itself. Wikström et al. tested the effect of (not) lagging the independent variables by comparing relationships between variables when crime data either refers to the same year or the previous year. "Comparing the two approaches shows

[32] Summing the data is desirable to assess statistical interactions in non-situational individual level data because stability is of benefit to these sensitive analyses. Although summing the data exacerbates the violation of causal ordering and may overestimate effects of dependent variables on crime, new longitudinal models that take account of bi-directional effects over time show that the effect of crime on propensity is much less than the effect of propensity on crime (Wikström, Treiber, et al., Forthcoming), and since generalised measures of propensity and to a lesser extent perceived parental knowledge are relatively stable over time the effect can only be overestimated by and not created by summing.

that which strategy is adopted makes little difference for the magnitude of the correlation between crime and crime propensity or criminogenic exposure" (Wikström, Oberwittler, et al., 2012, p. 129). Relevant to the summed data used in chapter 9, Wikström, Oberwittler, et al. (2012) found that the impact of the temporal mismatch on the summed variables (in their case age 13-17) was "even more negligible" (p. 131).

In sum, the comparative data reference periods of data collected all within the same interview are suited to the analysis of fast-paced situational processes, and it is not particularly problematic that this design violates assumptions about the importance of ordering cause before effect. For this reason, the middle right design depicted in Figure 11 (and a summed version of it) is adopted for the individual-level analyses in chapter 9.

8.3.3.2: Hour level

The design options for hour-level analyses are depicted in the bottom row of Figure 11. The crime outcome is captured by a binary STB variable stating whether a crime occurs during a particular hour, and the STB also captures the guardians present during that same hour. The generalised measures of crime propensity and parental knowledge for each person are applied to their STB hours. A design that strictly adheres to a 'cause before effect' design (bottom left; Figure 11) results in individual-level measures being applied to hours that took place around a year later in order to analyse split-second causal processes. Causal ordering is plausible, but the data reference periods are unsuitable. This may reduce the quality of analytical models because different time lags for measures can result in quite differing performances as covariates (P. Cohen, 1991). The alternative is to violate the 'cause before effect' principle and apply individual-level causes to hours (including crime hours) that took place in the past (bottom right; Figure 11). The latter design is preferable because the reference periods of the measures are at most only seven days apart and therefore much more suitable for the analysis of short-term situational processes. This design is applied to the analyses presented in chapter 10.

8.4: Summary

This chapter introduced the PADS+ study and sample (section 8.1:), and its Young Person's Questionnaire (YPQ) and Space-Time Budget (STB) research instruments which collected the data used for this study. This data comprises individual level measures of crime frequency, crime propensity, and adolescent perceived parental knowledge (section 8.2.1:); and hour level measures of acts of crime and guardian status (section 8.2.2:). Crucially, the nature of STB data means that all these measures can be transformed and analysed at the same level – either by applying

individual level measures to hours (section 8.3.1:) or by aggregating hour measures to individuals (section 8.3.2:). This complex combination of data that can be analysed at two different levels is summarised in section 8.3.3:. Of crucial importance for the analysis of situational interaction in chapter 10, the STB methodology links these measures in time and space (section 8.2.2.1:) and therefore captures the behavioural outcome that results from the convergence of these features of individuals with these features of settings.

PART IV: ANALYSIS:

Testing the situational hypothesis

9 Person-environment dependence

This thesis aims to assess evidence of the role of the presence or absence of guardians, adolescent-perceived parental knowledge and personal crime propensity in the situational process that leads to acts of crime (for a summary, see section 6.3.2:). The situational nature of the proposed mechanisms requires analysis of situational data in order to assess situational interaction (chapter 7). This situational analysis is carried out in chapter 10. However, situational data is rare, so a more traditional approach analyses non-situational data at the individual level using additive, regression-based methods (for a discussion, see chapter 7). This traditional approach is adopted by this chapter in order to assess statistical interaction at the individual level for evidence of dependency between unsupervised hours, adolescent-perceived parental knowledge and personal crime propensity in the prediction of individual crime frequency. The combination of a conventional approach in this chapter in addition to a situational approach in the following chapter allows this thesis to distinguish these two approaches and also provide a range of evidence relevant to the assessment of the role of physical and psychological presence in the situational process leading to acts of crime.

The first part of this chapter (section 9.1:) begins with a description of the basic interrelationships between individual level measures of unsupervised hours, perceived parental knowledge and crime propensity (independent variables). Strong relationships between these variables mean that once they are categorised and intersected, a skew in group membership is apparent. This bias illustrates the effects of processes of selection and emergence (discussed in section 5.2:). Since the focus of this thesis is on the situational process, these effects are not studied further. Section 9.1: goes on to introduce the basic relationships between these independent variables and the (dependent) crime outcome.

The second part of this chapter focuses on statistical interaction between the individual level variables (section 9.2:). It is methodologically difficult and complex to demonstrate and interpret interactions in this kind of data (section 7.2:). Findings from multiple methods build evidence that suggests that measures of perceived parental knowledge and unsupervised hours interact to some degree with each other and a person's crime propensity in predicting crime. Section 9.3: concludes about whether and how this evidence of statistical dependency can inform the study of situational interaction.

9.1: Unsupervised hours, perceived parental knowledge, crime propensity, and crime

Individual level measures of crime propensity, perceived poor parental knowledge and crime outcome (prevalence and frequency) are captured using the annual young person's questionnaire. Unsupervised hours are measured using the annual Space-Time Budget (STB) and are aggregated to the individual for the purposes of the individual level analyses presented in this chapter; providing a count of hours each person has spent unsupervised during the STB reference period during that year (section 8.3.2:). For details on all the measures used in this chapter see chapter 8.

The purpose of these analyses is not to assess change over time and developmental processes, rather, to begin to address the nature of situational processes in which unsupervised time and perceived parental knowledge may be implicated. For many analyses in this chapter, the annual measures of crime frequency, crime propensity, perceived parental knowledge and unsupervised hours for each person are summed over the study period, for those participants who took part every year. This provides measures spanning age 13-16. For some other analyses the data is pooled for all years so that the level of analysis becomes a person-year (each person contributes a case for each year).

9.1.1: Basic interrelationships

Table 8 shows the degree of association between individual level measures of perceived poor parental knowledge, unsupervised hours, and crime propensity. All variables significantly and positively interrelate. The relationship between crime propensity and perceived poor parental knowledge is particularly strong (r = .52 pooled; r = .65 summed; p = .000), signifying that young people who perceive that their parents often know the circumstances of their unsupervised activities are also usually those who are least crime prone (strong law-relevant moral rules and ability to exercise self-control).[1] The relationship with individual crime propensity is weaker for unsupervised hours than it is for perceived poor parental knowledge, but there is a considerable and significant association (r_s = .32 pooled; r_s =.49 summed; p = .000; Table 8) signifying that those participants with a high crime propensity spend more time unsupervised than those with a lower crime propensity. Both these relationships are to be expected. These factors (or factors for which these factors may also be markers)[2] are likely to play some role in the process of personal emergence and the development of crime propensity (see further, section 5.2.1.2:). In addition,

[1] This strong correlation is not so strong that it raises major concern about multicollinearity in later regression analyses, particularly since later analyses show that the statistical interaction between these variables is also the strongest, suggesting that this correlation is, in part, driven by the interaction.

[2] Not least, adolescent perception of parental knowledge is likely to be strongly related to actual parental knowledge.

individual characteristics (which may include crime propensity or other factors related to crime propensity) may influence or be implicated in processes of selection, that determine the kinds of settings individuals are exposed to (including whether those settings contain a guardian or are known about by parents) (see further, section 5.2.2:). The role of parental monitoring variables in processes of selection and emergence will not be addressed in this thesis; however, it raises two questions relevant to the study of situational processes. First, any observed effects of situational interaction must remain irrespective of differing levels of exposure that result from selection processes. Second, it remains to be discovered whether any relationships between perceived parental knowledge and crime, and unsupervised hours and crime, are independent of crime propensity, and if so, if this is evidence of a situational role for these factors.

Table 8: Correlations between key variables age 13-16

Age 13-16	**PPParental Knowledge**	**Crime propensity**	**Unsupervised hours**
Perceived poor parental knowledge	1	.52	.33
Crime propensity	.65	1	.32
Unsupervised hours	.45	.49	1

PPParental knowledge = Perceived poor parental knowledge.
All correlations p = .000. Correlations for the pooled data are shown in the top part of the table (n range 2793-2864); correlations for summed data are below (n range 681-701). Correlations between knowledge and propensity are zero-order as they are approximately normally distributed; those involving supervision are rank correlations due to a slight skew.[3]

The relationship between unsupervised hours and perceived poor parental knowledge is moderate (r_s = .33 Pooled; r_s =.45 summed; p = .000), but signifies to a degree that adolescents who are more often in the presence of guardians report that they perceive their parents know more often about the circumstances of their unsupervised activities. These factors tap different concepts, but are both related to parental monitoring (section 4.3:) and therefore a relationship is expected. It is difficult to assess existing findings relevant to the relationship between these particular measures because these and related concepts are commonly so poorly defined (chapter 4). However, this finding is broadly congruent with varied discussions within the parental monitoring literature; for example, parenting style or family relations may be implicated in the explanation of the relationship between unsupervised hours and perceived poor parental knowledge.[4]

[3] The Pearson and Spearman correlation coefficients for all correlations were actually very similar. For each relationship, they were within .02 of each other.

[4] For example, research into parenting styles and behaviour described in section 3.2: suggests that parenting behaviour is internally consistent for many parents, and for example, the kind of parent who ensures their child is in the presence of guardians a lot may, for the same reasons, also be interested and motivated to know about the child's activities when they are unsupervised. Alternatively, findings that suggest that parental knowledge is rooted in child disclosure might lead researchers to hypothesise that more time spent with parents might improve (or at least be

9.1.2: Group membership

One method to depict interaction between dependent variables is to categorise the variables, create groups based on their intersection and then compare the group mean crime frequency (for a discussion, see section 7.2:). This section describes and discusses the implications of the creation of these groups.

Trichotomised individual level measures of crime propensity, unsupervised hours and perceived parental knowledge are intersected to create groups. Thus, nine groups are created for each 2-way intersection, and 27 groups are created when all three variables intersect. The previous section describes how processes of selection and emergence might be responsible for strong relationships between the independent variables. These relationships mean that when individuals are categorised based on the intersection of these variables the resultant groups can vary dramatically in size. In addition to the effects of these processes, varied group sizes and very small groups are particularly likely because each variable is categorised based on boundaries that are +/- 1 standard deviation from the mean (see chapter 8). This method of categorisation is designed to capture extremes which may be able to show up interaction effects in the data, however, it means that the categories are unequal. This is particularly exaggerated once these categorised variables are intersected.

Whilst this thesis is not concerned with the explanation of these different group sizes, the small or non-existent 'extreme' groups may cause problems for plotting interaction graphs and are likely to result in unstable group means. This is problematic because any evidence of the situational process must remain consistent irrespective of group size because SAT states that the same cause (situational process) influences action regardless of the causes of the cause (social processes). The particularly small groups are highlighted here.

Groups characterised by extreme scores on one, two or all three variables are at most risk of capturing very few or no participants, particularly if the relationship between the variables characterised by the group is at odds with the bivariate correlations shown in Table 8. Table 9 shows that six of the 27 groups in the three-way intersection capture no participants at all. For example, no participants are simultaneously categorised as reporting high unsupervised hours as well as having a low crime propensity and perceiving good parental knowledge.

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indicative of) good parent child relations and communication, thus improving child disclosure of the circumstances of their activities when unsupervised (e.g., Fletcher et al., 2004; Kerr & Stattin, 2000; Soenens et al., 2006; Stattin & Kerr, 2000).

Table 9: Group membership (age 13-16 summed): Crime propensity, perceived parental knowledge and unsupervised hours (three groups)

Crime propensity	Unsupervised hours	Perceived parental knowledge: Good		Medium		Poor		Total	
		n	%	*n*	%	*n*	%	*n*	%
Low	Low	27	*4.0*	10	*1.5*	-		37	*5.4*
	Medium	26	*3.8*	40	*5.9*	-		66	*9.7*
	High	-	-	1	*0.1*	-		1	*0.1*
Total		53	*7.8*	51	*7.5*	-		104	*15.3*
Medium	Low	18	*2.6*	39	*5.7*	4	*0.6*	61	*9.0*
	Medium	39	*5.7*	277	*40.7*	47	*6.9*	363	*53.3*
	High	4	*0.6*	30	*4.4*	11	*1.6*	45	*6.6*
Total		61	*9.0*	346	*50.8*	62	*9.1*	469	*68.9*
High	Low	-	-	1	*0.1*	1	*0.1*	2	*0.3*
	Medium	1	*0.1*	30	*4.4*	29	*4.3*	60	*8.8*
	High	-	-	18	*2.6*	28	*4.1*	46	*6.8*
Total		1	*0.1*	49	*7.2*	58	*8.5*	108	*15.9*
Grand Total		115	*16.9*	446	*65.5*	120	*17.6*	681	*100.0*

Table 10: Group membership: Perceived parental knowledge and unsupervised hours

Age 13-16 (summed)		Perceived parental knowledge: Good		Medium		Poor		Total	
		n	%	*n*	%	*n*	%	*n*	%
Unsupervised hours	Low	45	*6.6*	50	*7.3*	5	*0.7*	100	*14.7*
	Medium	66	*9.7*	347	*51.0*	76	*11.2*	489	*71.8*
	High	4	*0.6*	49	*7.2*	39	*5.7*	92	*13.5*
Total		115	*16.9*	450	*65.5*	120	*17.6*	681	*100.0*

Table 9 also contains 'total' rows and columns that show the size of groups that are created by the intersection of only two of the three variables (see Table 10 for the two-way intersection of unsupervised hours and perceived parental knowledge). The skew in group membership due to the bivariate relationships between the independent variables is particularly apparent. For example, there are no participants who have a low crime propensity but who perceive their parents to have poor knowledge of the circumstances of their unsupervised activity, and only one participant who has a high crime propensity but who perceives their parents to have good knowledge. Similarly there is only one participant for whom propensity is low and unsupervised hours is high and only two participants in the opposite group, for whom propensity is high and unsupervised hours is low. Finally (Table 10), it is very unusual for adolescents to be in the

presence of guardians very often, but for adolescents to perceived that their parents have poor knowledge about their activities when they are unsupervised (n=5; 0.7%). The group who are often unsupervised but whose parents know a lot about their unsupervised activities (n=4; 0.6%) is also small.

When intersecting key individual variables, the role of these key variables in processes of selection and emergence combined with a categorisation strategy that aims to isolate extremes, results in some groups that are empty or too small to be reliably used to compare group crime frequency means. For this reason, for some analyses the perceived parental knowledge, unsupervised hours and propensity variables are instead dichotomised. For each variable, participants are divided depending on whether they fall above or below the mean. This makes for larger groups that are more equal in size and, once intersected, make for more stable group means. Table 11 shows group membership based on the intersection of the three dichotomised variables.

Table 11: Group membership (age 13-16 summed): Crime propensity, perceived parental knowledge and unsupervised hours (two groups)

Crime propensity	Unsupervised hours	Perceived parental knowledge				Total	
		Good		Poor			
		n	%	*n*	%	*n*	%
Low	Low	188	*27.6*	74	*10.9*	262	*38.5*
	High	61	*9.0*	42	*6.2*	103	*15.1*
Total		249	*36.6*	116	*17.0*	365	*53.6*
High	Low	50	*7.3*	69	*10.1*	119	*17.5*
	High	32	*4.7*	165	*24.2*	197	*28.9*
Total		82	*12.0*	234	*41.7*	316	*46.4*
Grand Total		331	*48.6*	350	*51.4*	681	*100.0*

These groups also vary in size due to the relationships between these variables. The direction of this variation is the same as for the intersection of the trichotomised variables discussed above. However, the smallest group still captures 4.7% of the participants - this group are those who report a high crime propensity, perceive good parental knowledge, and yet experience a high number of unsupervised hours. Whilst these groups will allow easier plotting of more stable interaction graphs than those created by the trichotomised variables, variation in the independent variables is lost and the group means are a much cruder outcome measure. These issues should be borne in mind when interpreting interaction graphs in this chapter.

9.1.3: Basic relationships with crime

An individual's perceived poor parental knowledge, unsupervised hours, and, in particular, crime propensity during the study period each strongly, positively, and highly significantly correlate with their total crime frequency (Table 12).[5, 6]

Table 12: Rank correlation coefficients between age 13-16 (summed) variables and age 13-16 total crime frequency

	r_s	Sig.	*n*
Perceived poor parental knowledge	.554	.000	701
Unsupervised hours	.459	.000	687
Crime propensity	.696	.000	694

In a further illustration of these relationships, Table 13 presents the mean total crime frequency for participants in groups at different levels of parental knowledge, unsupervised hours, and propensity.[7] Non offenders appear in all groups for each variable (albeit least in each of the low crime propensity, least unsupervised hours and perceived good parental knowledge groups); however, the highest frequency offenders appear mostly in each of the high crime propensity, most unsupervised hours and perceived poor parental knowledge groups. This results in a much higher mean number of crimes and higher standard deviations for these groups. The crime propensity, unsupervised hours and perceived parental knowledge groups show a marked and significant increasing trend in crime frequency, where crime frequency is highest amongst participants who report i) a high crime propensity, ii) most unsupervised hours or iii) that their parents know least about the circumstances of their unsupervised activities (Table 13).[8]

[5] Due to the strong skew of the crime frequency variable, Spearman's rank correlation coefficients are reported.
[6] The relationships between these variables show a very similar pattern at each age (analysis not shown).
[7] This illustration uses summed data from the whole study period (age 13-16) but the means also show the same pattern within each year (analysis not shown).
[8] Non-parametric independent samples Kruskal-Wallis tests confirm in each case that the null hypothesis (the distribution of crime frequency is the same across categories) is rejected. Unsurprisingly, Jonckheere-Terpstra tests also reveal that the increasing trend in the data is significant (p= .000).

Table 13: Mean crime frequency by crime propensity, unsupervised hours and perceived parental knowledge groups (+/- 1 std. dev.)

		Mean crime frequency	*n*	Std. dev.	Kruskal-Wallis sig.
Crime propensity	Low	5.1	102	31.8	.000
	Medium	14.5	493	34.8	
	High	48.2	92	71.1	
Unsupervised hours	Low	0.7	107	2.1	.000
	Medium	10.6	477	20.3	
	High	65.0	110	84.3	
Perceived parental knowledge	Good	1.9	119	7.2	.000
	Medium	14.5	458	39.0	
	Poor	45.7	124	62.7	

These bivariate relationships between unsupervised hours and crime and parental knowledge and crime replicate findings from many previous studies, including those that use different measures of the parental monitoring related variables (see section 3.3: and chapter 5). This thesis is focused on the direct situational effects of these variables, not any indirect effect they may have on crime via their influence on individual development of crime propensity. This means that it is important to know the independent effect of these variables, over and above that of propensity. This is much less tested because studies of parental monitoring and crime tend not to also capture and analyse individual crime propensity (chapter 5).

Table 14 presents two regression models predicting crime frequency.[9] The unit of analysis is individuals. The crime frequency outcome variable is highly skewed. Since this violates the assumptions of OLS linear regression, the table shows three models, one predicting unlogged crime frequency and two predicting logged crime frequency. The model predicting unlogged crime frequency is estimated using heteroscedasticity-consistent (robust) standard errors.[10] This widens the confidence intervals, correcting for the heteroscedasticity of residuals resulting from the non-normal distribution of the dependent variable. The log-transformation of the dependent variable in the second model is an attempt to normalise the distribution. However, logarithmic transformation does not normalise the dependent variable (see section 8.2.1.2:). Therefore, to be conservative, the third model predicts the logged crime frequency and also estimates heteroscedasticity-consistent robust standard errors. Despite the measures taken, not one of these methods represents a perfect analytical antidote to the awkward distribution of the dependent variable (see section 7.2:).

[9] All regression models in this chapter are fit using SPSS 21, unless otherwise stated.

[10] This was conducted using the Robust Linear Models (RLM) macro for SPSS coded by Darlington and Hayes (2017). The macro uses five slightly different methods to estimate heteroscedasticity-consistent standard errors. The results from all five methods were substantively the same, so the results using only one method is shown here (HC3).

Table 14: OLS linear regression predicting crime frequency (*n*=681)

Age 13-16 (summed)	Crime frequency (unlogged)		Crime frequency (logged)		Crime frequency (logged)	
	Beta	Robust SE	Beta	SE	Beta	Robust SE
PPParental knowledge	.026	1.775	.153***	.024	.102***	.024
Propensity	.438***	2.912	.540***	.024	.359***	.025
Unsupervised hours	.081	2.646	.124***	.021	.083***	.021
R2x100	25.2		52.2		52.2	

* p<.05; ** p<.01; *** p<.001.
All independent variables are z-standardised.
PPParental knowledge = Perceived poor parental knowledge.

The three models in Table 14 show mixed results. In the two models predicting logged crime frequency, all three predictors have an independent effect on the transformed crime frequency outcome. However, when the dependent crime frequency variable is left unlogged, though still corrected for heteroscedasticity, only crime propensity has an independent effect. In all three models, individual crime propensity has a large effect on crime frequency, independently of the parenting variables. However, due to opposing results, a conclusion is not clear. If propensity fully accounts for the bivariate correlation relationships between perceived poor parental knowledge and crime and time spent unsupervised and crime, this suggests that the parenting variables have no effect on crime other than through their influence on the development of crime propensity. If perceived poor parental knowledge and time spent unsupervised have their own independent effect on crime, over and above any effect of crime propensity, then this suggests that there may be roles for these factors in situational processes.

Exploration of these inconclusive findings will not continue because SAT expects an interaction between individual and environmental features when predicting crime outcomes. This means that it is possible that across all individuals the effect of certain environmental features is small, but that same environmental feature has a large effect for certain kinds of people. This means that the absence of a statistically significant main effect in a multiple regression model is entirely consistent with a theoretical model that expects interaction effects. When testing for interaction effects, attention to main effects is misplaced. The following section uses a range of traditional methods to test interaction between individual level variables.

9.2: Statistical interaction

The situational approach of this thesis demands investigation of how these variables inter-relate in the explanation of crime, with a focus on their interaction. In particular, when applied to

individual level analysis of statistical interaction, the confirmation of the situational hypothesis requires findings that show that while perceived parental knowledge and unsupervised time interact to predict crime frequency, this interaction itself is moderated by crime propensity.

Section 7.2: discussed some generally inherent problems in identifying statistical interaction effects so the approach of this section is to use a range of methods and models to test hypotheses and investigate interaction in the data, in order to gain an overall picture of the nature of any such interaction. This multi-method approach for assessing statistical interaction is also taken by Hirtenlehner and Hardie (2016). In the rest of this chapter, OLS linear regression, an 'Inteff' procedure applied to logistic regression, fixed-effects regression and graphical representations are all used to explore the presence and nature of two- and three-way interactions between individual level measures of crime propensity, unsupervised hours and perceived poor parental knowledge in predicting crime. These various methods, and their benefits and drawbacks, are discussed in section 7.2: Due to the mixed and complex nature of the results, the findings will only be fully interpreted in section 9.3:

9.2.1: Two-way interactions

Usually, product terms are tested hierarchically (Edwards, 2009), i.e., first estimating a model with only the *X* and *Z* independent variables, then estimating a second model that includes the multiplicative interaction (product) term (*XZ*), and finally testing the difference in R^2 between these two models using an *F*-ratio. When three-way interaction is hypothesised, a third model involving at least all three independent variables, a three-way product term and the three two-way interaction terms relevant to the variables involved in the three-way interaction are estimated. The models in the previous section represent the first step of this process. However, not only is this full process unnecessary (Edwards, 2009), it can be misleading. When a later model indicates the existence of interaction, the lower order effects in earlier models should be disregarded. This is because interpretation of the lower order effects is meaningless in the light of higher order interaction in a subsequent model (Edwards, 2009).[11]

OLS regression models in the following section show significant three-way interaction terms. However, the lower order effects are still assessed for two-way interaction in this section. This is because this finding of three way statistical interaction is not fully replicated in analyses of data that do not sum the variables for each year (section 9.2.3:). The complications with assessing statistical interaction outlined in section 7.2: mean that it is prudent to draw conclusions based on

[11] This statistical argument is wholly consistent with an interactive worldview, analytical criminology and SAT, which all state that it is incorrect and meaningless to analyse component parts of an interactive whole (see Part I).

a wide range of findings. Therefore, two-way interaction is assessed in this section using alternative methods, though the findings will be interpreted fully only in section 9.3:

Although not itself without problem, an alternative method to OLS multiple linear regression for assessing statistical interaction is the Inteff procedure, which when applied to logistic regression estimates the average overall interaction inherent in the data (for a description of the method, see section 7.2:). Since the Inteff procedure requires that each two-way interaction must be assessed independently, it was applied to each of three logistic regression models containing two of the independent variables and their product term.[12] The results show that there is significant statistical interaction inherent in the data between perceived poor parental knowledge and crime propensity, and between perceived poor parental knowledge and unsupervised hours, in predicting crime prevalence (Table 15). The third interaction between crime propensity and unsupervised hours is not significant at the .05 level, but is significant at a less rigorous .10 level.[13]

Table 15: Inteff estimations of two-way interaction effects inherent in three independent logistic regression models predicting age 13-16 crime prevalence

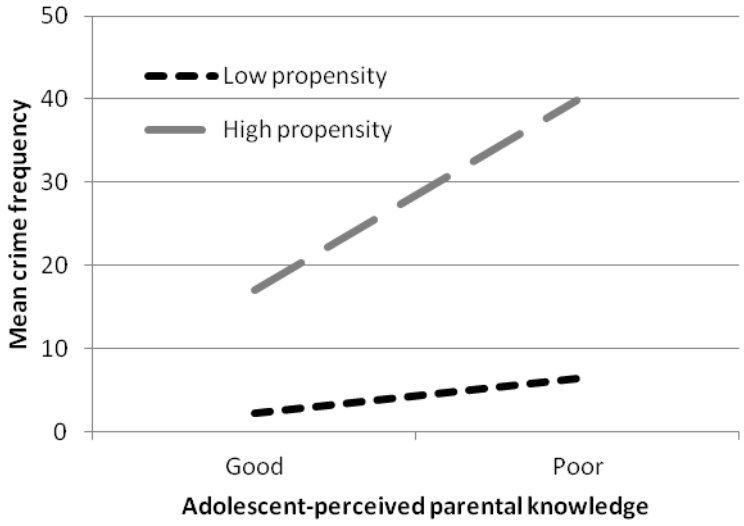
Interaction	B	SE	Z	Sig.
PPParental knowledge x Crime propensity	-0.045	0.022	-2.64	0.008
PPParental knowledge x Unsupervised hours	-0.033	0.021	-3.06	0.002
Crime propensity x Unsupervised hours	-0.020	0.027	-1.75	0.080

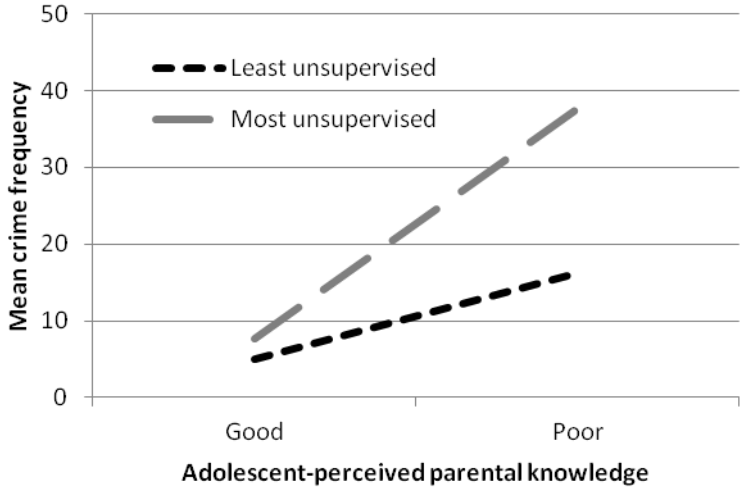
PPParental knowledge = Perceived poor parental knowledge

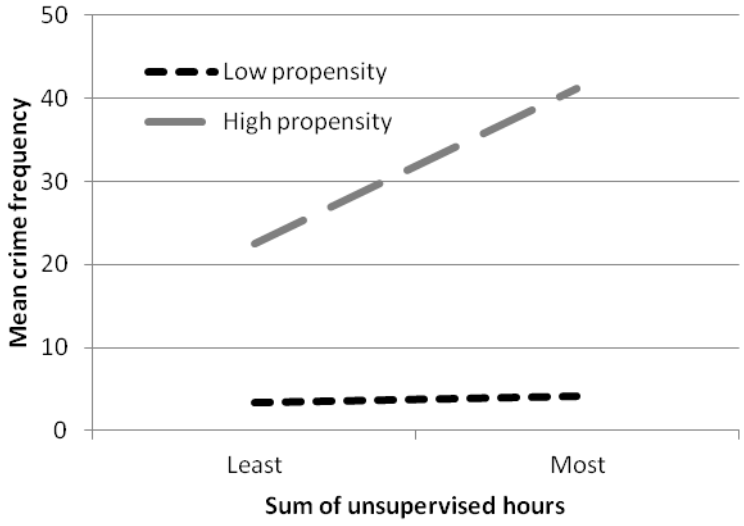
The nature of the Inteff procedure means that it is difficult to interpret the nature of any statistically defined interaction from the model result alone. Another way to assess interaction between variables is via visual assessment, which is often a more straightforward way to get some understanding of the nature of difficult-to-interpret statistical interaction effects (section 7.2:).

[12] Model fit and Inteff procedure applied using STATA 12. The three predictor variables were z-standardised before computing each multiplicative interaction term (Aiken & West, 1991; Jaccard et al., 1990). Clustered robust standard errors were employed to account for the non-normal distribution of the dependent crime prevalence variable.
[13] *Z* would need to be -1.96 in order to reach significance at the .05 level.

Figure 12: Graphical representations of two-way interactions and age 13-16 mean total crime frequency







The graphs in Figure 12 show three separate intersections each of two dichotomised variables (above/below the mean). Each graph can be assessed for evidence of two-way interaction whereby a dependency effect is signified by a gradient of association between one independent variable and the dependent outcome that increases or decreases according to increase or decrease in the other dependent variable (section 7.2:). In line with the general picture of Inteff results, graphical representations of the two-way intersection of these variables and the resultant group mean crime frequencies certainly suggest that there are multiple forms of two-way interaction inherent in the data.

In line with expectations, Figure 12 suggests that crime propensity moderates the relationship between both perceived parental knowledge and crime (top graph) and unsupervised time and crime (bottom graph). The middle graph of Figure 12 suggests that the amount of unsupervised hours moderates the effect of perceived parental knowledge on crime.[14]

Taken together, Inteff analyses and graphs of the comparisons of group means in this section demonstrate varying degrees of two-way interactions between all three variables (crime propensity, unsupervised hours and perceived parental knowledge) in predicting crime.

9.2.2: Three-way interaction

So far, only two-way statistical interactions have been explored, but testing data for evidence of situational interaction at the individual level calls for investigations of statistical interactions between all three independent variables in the situational processes leading to crime. Specifically, that the sum of unsupervised hours moderates the effect of perceived parental knowledge on crime, and the effect of this relationship (which captures criminogenic exposure) on crime is itself moderated by crime propensity (i.e., ((*PPPK x UNSUP) x Prop)* → *Crime*). Linear regression models are capable of estimating the effects of three-way statistical interaction at the individual level, though the specifics of the interpretation are aided by visual assessment and statistical comparison of group averages.

[14] There are some existing findings at the individual level about the relationship between parental knowledge and supervision in the prediction of adolescent outcomes. However, although these findings are not in disagreement with the hypotheses of this study, they are not directly comparable because these studies predict different behavioural outcomes, and study active parental monitoring and not adolescent perceived parental knowledge (for a distinction, see section 4.2:). For example, Laird et al. (2010) show that the negative relationship between active parental monitoring and anti-social behaviour is stronger for those most commonly unsupervised; see also (Stattin & Kerr, 2000). In their study of externalising problems, Pettit, Bates, Dodge, and Meece (1999) concluded that "monitoring also acted as an exacerbator (when monitoring was relatively low) and a buffer (when monitoring was relatively high) of unsupervised peer contact" (p. 776). Furthermore, the proposed processes being tested vary (and are not well specified), for example Pettit et al. (1999) appear to focus on developmental outcomes while Laird et al. (2010) imply the relevance of setting criminogeneity for action when they reference opportunities for involvement in anti-social behaviour.

Table 16: OLS robust standard error linear regression predicting crime frequency

Age 13-16 (summed)	Logged				Unlogged			
	Model 1		Model 2		Model 3		Model 4	
	Coeff	Robust SE	Coeff	Robust SE	Coeff	Robust SE	Coeff	Robust SE
PPPK	.102***	.024	.120***	.025	1.946	1.653	2.975***	1.212
Prop	.359***	.025	.370***	.025	15.754***	2.203	16.863*	2.325
Unsup	.083***	.021	.106***	.022	2.747	2.542	4.321***	1.934
Prop²					7.982***	1.604	6.449*	2.673
PPPK x Prop			.020	.016			3.204*	4.247
PPPK x Unsup			-.015	.020			1.971	2.497
Prop x Unsup			.036	.020			-2.096	1.706
PPPK x Prop x Unsup			-.039***	.010			-2.500*	1.147
R^2x100 (%)	52.2		53.2		32.6		33.7	

* p<.05; ** p<.01; *** p<.001.
PPPK = Perceived poor parental knowledge; Prop = Crime propensity; Unsup = Unsupervised hours;
All independent variables are z-standardised (Aiken & West, 1991).

Table 16 shows OLS regression models of individual level crime frequency, with a three-way product term added. Due to the problems encountered due to the skew of the dependent variable, various regression models estimate both logged and unlogged crime frequency. Both these sets of models are estimated using heteroscedasticity-consistent (robust) standard errors to correct for heteroscedasticity of the residuals[15] because even log-transformation does not fully normalise the distribution of the crime frequency variable (see section 8.2.1.2:). The main problem with attempting to normalise a zero-inflated negative-binomial data distribution such as crime frequency count data is that the many zeros (non-offenders) can never be linearised. Models 1 and 2 in Table 16 predict logged crime frequency, and models 3 and 4 predict the untransformed crime outcome. For the models of the unlogged dependent variable, quadratic terms of the predictors to be involved in the three-way interaction were computed. An initial model predicting unlogged crime frequency that included the three predictors and their quadratic terms, but excluded interaction terms, showed that only the quadratic term of the crime propensity variable was significant (model not shown).[16] The same model including only the significant quadratic term alongside the independent variables is shown in Table 16 (model 3). This indicates that the nonlinearity of the relationship between crime propensity and crime should be considered in any model that is to include multiplicative interaction terms (Edwards,

[15] This was conducted using the Robust Linear Models (RLM) macro for SPSS coded by Darlington and Hayes (2017). The macro uses five slightly different methods to estimate heteroscedasticity-consistent standard errors. The results from all five methods were substantively the same, so the results using only one method is used here (HC3).
[16] These models were also estimated using heteroscedasticity-consistent robust standard errors.

2009; Lubinski & Humphreys, 1990). Not accounting for the nonlinearity of relationships may increase the likelihood of type-II error (i.e., falsely rejecting a 'true' moderation effect), so it might turn out to be important to include quadratic terms when evidencing interaction effects.[17]

When estimating three-way interaction terms, all three two-way interaction terms of the three variables involved in the three-way interaction must also be simultaneously included in the model (Braumoeller, 2004).[18] Table 16 (models 2 and 4) shows these regression models which predict individual level crime. These models include the three individual level variables involved in the three-way interaction being assessed (i.e., perceived poor parental knowledge, crime propensity, and unsupervised hours); the quadratic term for crime propensity in only the unlogged model (model 4); all two-way interaction terms; and the multiplicative three-way interaction term.

There are three things to highlight about the regression models in Table 16.[19] Importantly, the coefficients of the three-way interaction terms are significant, despite being estimated using heteroscedasticity-consistent robust standard errors. The existence of a statistically significant statistical three-way interaction term is particularly impressive in model 2, considering the problems associated with removing variation from a dependent variable by means of log-transformation, which perhaps suggests that the statistical interaction in the data is quite strong (Hirtenlehner & Hardie, 2016). Second, the inclusion of the interaction effects slightly increases the percentage share of explained variance in both the logged and unlogged models (by around one percentage point). Third, when predicting unlogged crime frequency, adding the interaction terms has the effect of reducing the coefficient of the quadratic term of crime propensity by around one fifth between the model 3 and model 4, indicating that the curvilinearity of the relationship between crime propensity and crime is reduced. This finding suggests that it was the curvilinearity that was partly spurious, not the interaction effect, and therefore it would be false to reject the interaction effect.

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[17] It is unlikely to be necessary to include quadratic terms in models predicting a logged outcome, and in fact, it may even result in over-controlling. However, the quadratic term for propensity was small but slightly significant (0.025; $p<.05$) when included in a model equivalent to model 1 in Table 16. For this reason, models 1 and 2 in Table 16 were also run including the quadratic term for propensity. Results were almost identical (not shown) (e.g., three-way interaction term coefficient was -.037 $p= .000$), with the exception of the two way interaction terms. These remained non-significant, but the coefficients were quite different, in apparently different ways, including changing signs. This is further example of the instability of interaction effects and the complexities surrounding their interpretation.

[18] Some argue that it is possible to remove non-significant two-way interaction terms from the model (Aiken & West, 1991). For models 2 and 4 in Table 16, the three-way interaction term retained the same significance and had very slightly weaker effect when the non-significant two-way interaction terms were removed from the model, and the total explained variance was almost unchanged (models not shown).

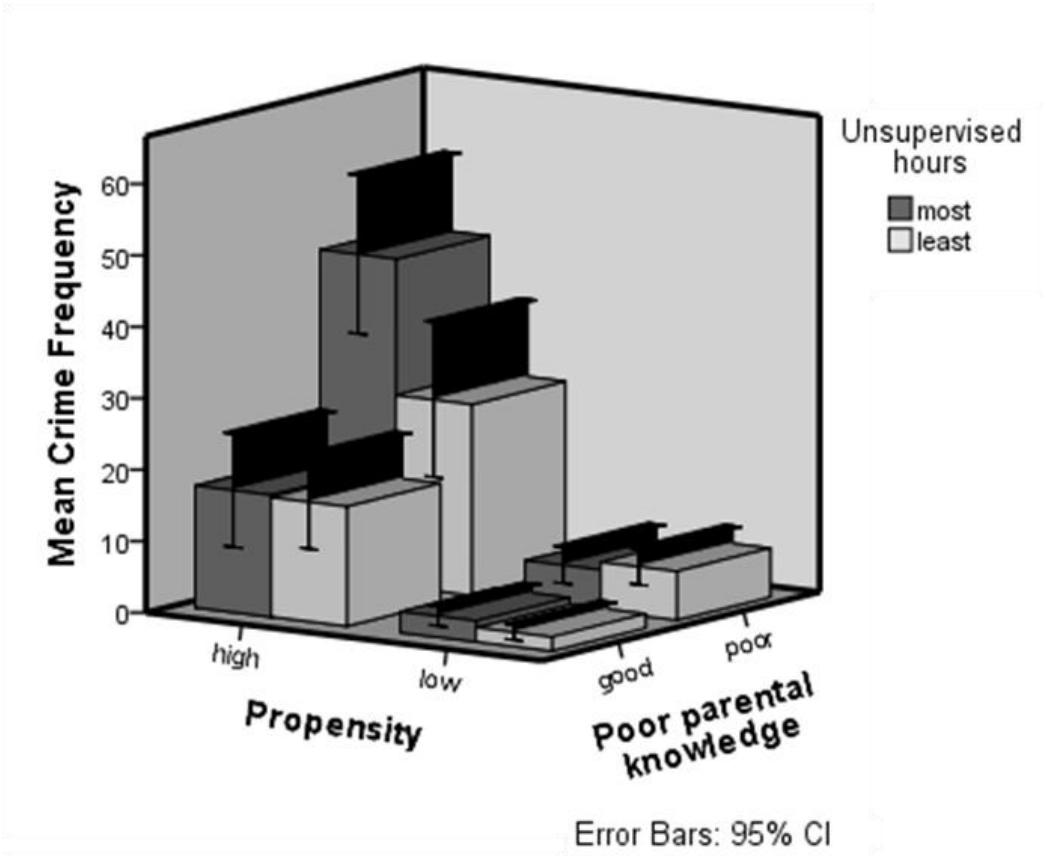
[19] The interpretation of lower order terms in the presence of interaction terms is complex. Their effect is conditional on the other when the other is at its mean (because the variables are mean-centred) (Braumoeller, 2004; Edwards, 2009).

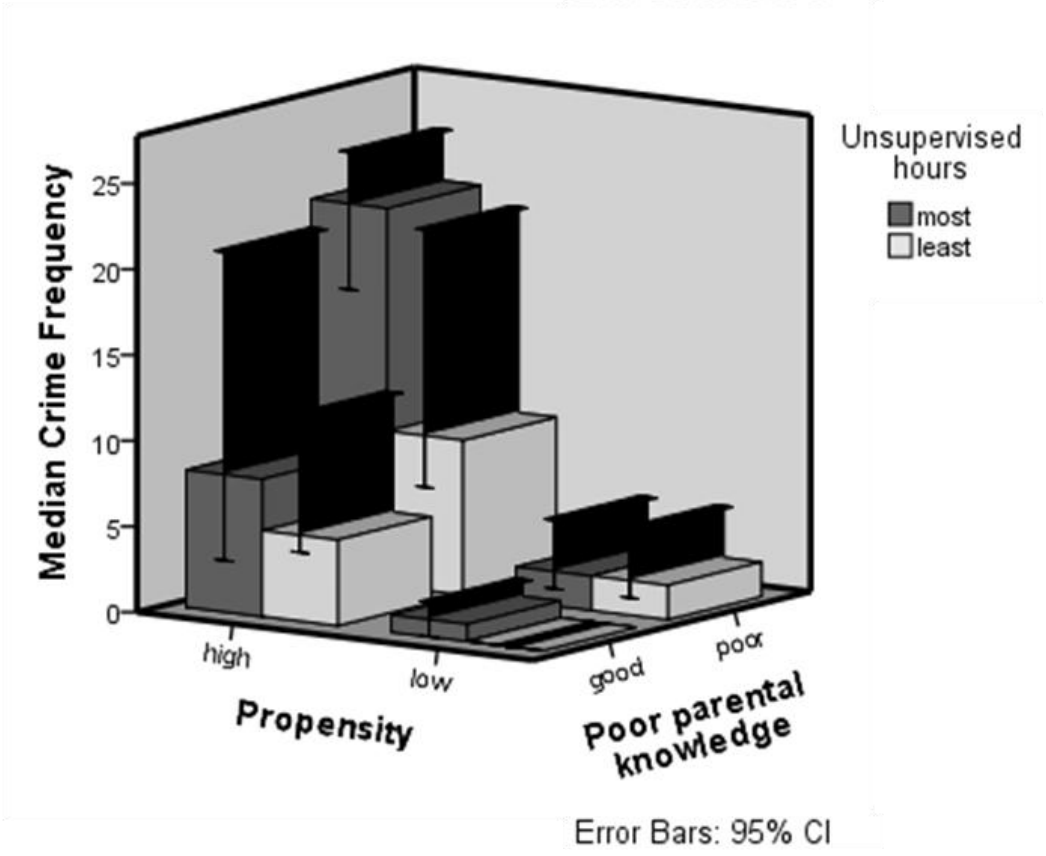
Taken together, these observations from Table 16 are evidence that there is some kind of complex statistical interaction between perceived poor parental knowledge, crime propensity, and unsupervised hours involved in the crime frequency of adolescents aged 13-16. The evidence for two-way interaction (and any interpretation that can be made of it) in the previous section is arguably surpassed (and arguably made irrelevant) by the subsequent evidence of three-way interaction among the same variables (see 9.2.1: and Edwards (2009)).

It is more complicated to conclude what this interaction means. Three-way multiplicative interaction terms are not only difficult to estimate, but they are notoriously difficult to interpret (Braumoeller, 2004; Edwards, 2009). In addition, logging the dependent variable makes models 3 and 4 in Table 16 logarithmic, which is known to cause additional problems when interpreting interaction effects (Hannon & Knapp, 2003; Svensson & Oberwittler, 2010). To start to address the nature of this complex interaction, interaction graphs can depict the mean crime frequencies of groups that are created by the intersection of all three independent variables. First, participants are dichotomised based on whether their score falls above or below the mean for each independent variable. These three dichotomised variables are then intersected which creates eight groups of participants (see Table 11 on page 270). The mean and median crime frequencies for these eight groups are plotted in Figure 13. Error bars are shown because the group sizes (and therefore also the stability of group means) vary (see section 9.1.2:; specifically Table 11 for group sizes).

Comparison of the average crime rates for individuals in groups defined by the intersection of their crime propensity, unsupervised hours and perceived parental knowledge in Figure 13 suggests that the relationship of these three individual level variables to individual crime frequency is interdependent. The interdependency is largely as expected, such that the interaction between perceived poor parental knowledge and unsupervised hours is moderated by crime propensity. This three-way interaction is discussed further in section 9.3:.

Figure 13: Graphs of group mean and median crime frequency by three dichotomised intersected variables (crime propensity, perceived poor parental knowledge and unsupervised hours), summed age 13-16.





9.2.3: By age

The analyses in this chapter have so far used data at the individual level that is summed over the four years of the study period (age 13-16). The benefit of summing annual scores is that it smoothes the effect of random variation (noise) in the data. However, there are a number of problems that summing the data from across the study period may cause - not least that it doesn't account for variation over time; for example, a person may have reported all their crimes in a single year. There are a number of alternatives to analysing the summed individual level measures.

The regression models testing three-way interaction shown in Table 16 (models 2 and 4; page 278) were also all estimated using the data for each year separately (results not shown).[20] For the unlogged crime outcome, no models showed any significant two- or three-way interaction terms. For the logged crime outcome, the three-way interaction term was significant at age 14, and at age 16 the two-way interaction between poor parental knowledge and crime propensity was significant. When less conservative models were estimated (without robust standard errors and quadratic terms; only logging the crime outcome in an attempt to normalise the dependent variable), both the two- and three-way interactions in these four annual sets of models are sporadically significant, but there is no pattern across the years as to which interactions appear relevant. Further, year-specific Inteff procedures yielded no significant two-way interaction terms (results not shown).

The mixed results from these models of annual data should not be taken as hard evidence of no statistical interaction. When assessing data for interaction, the reduction in random variation achieved by summing annual scores is particularly desirable. This is because the difficulty of demonstrating significant interaction terms in regression models becomes more pronounced when random noise is greater.

An alternative way to address the annual data is to pool it so that the level of analysis becomes the person-year whereby each participant contributes scores for each year they take part in the study (n = 2793; 'long format'). Although not all 710 participants took part in all four years of data collection, PADS+ retention is so high that the average number of observations per person is 3.9. In order to avoid confounding within- and between-individual effects, the data is nested within individuals in a fixed-effects model (Table 17).[21] Dummy variables for age (year) are

[20] All were estimated using heteroscedasticity-consistent standard errors and included the appropriate quadratic terms (for crime propensity each year, but also for unsupervised hours at age 16).
[21] Fixed-effects models fit using STATA 12.

included to ensure that estimates rest on the entire dataset, otherwise participants with invariant independent variables would drop out of the model. The dependent variable is logged, though the results are substantively the same when estimating the fixed-effects models for untransformed crime frequency (results not shown). In any case, the models are estimated using robust standard errors.

Table 17: Fixed effects regression model that asses three-way interaction in predicting (logged) crime frequency

	Coeff.	**Robust SE**
Perceived poor parental knowledge	.060***	.011
Propensity	.136***	.016
Unsupervised hours	.028**	.011
PPPK x Prop	.029**	.010
PPPK x Unsup	.010	.010
Prop x Unsup	.008	.010
PPPK x Prop x Unsup	-.007	.006
Age 14	.075***	.016
Age 15	.068***	.016
Age 16	.038*	.018
R^2x100	37.3	

* p<.05; ** p<.01; *** p<.001.
PPPK = Perceived poor parental knowledge; Prop = Crime propensity; Unsup = Unsupervised hours;
All independent variables are z-standardised, as is necessary before assessing interaction (Aiken & West, 1991).

Table 17 shows that, of the interactions included in the model, only the two-way interaction between perceived poor parental knowledge and crime propensity is significant in the prediction of (logged) crime frequency. In the absence of a statistically significant three-way interaction term, similar fixed-effects models were then estimated for each two-way interaction separately (Table 18). The interaction between poor parental knowledge and crime propensity is significant (p = .003). The interactions between poor parental knowledge and unsupervised hours (p = .067), and between propensity and unsupervised hours (p = .067), are only just non-significant at the p< .05 level, yet significant at the p< .10 level.

Table 18: Fixed effects regression models that assess two-way interaction in predicting (logged) crime frequency

	Coeff.	Robust SE
Perceived poor parental knowledge	.061***	.011
Propensity	.136***	.015
PPK x Prop	.029**	.010
Age 14	.073***	.016
Age 15	.071***	.016
Age 16	.040*	.018
R^2x100	36.0	

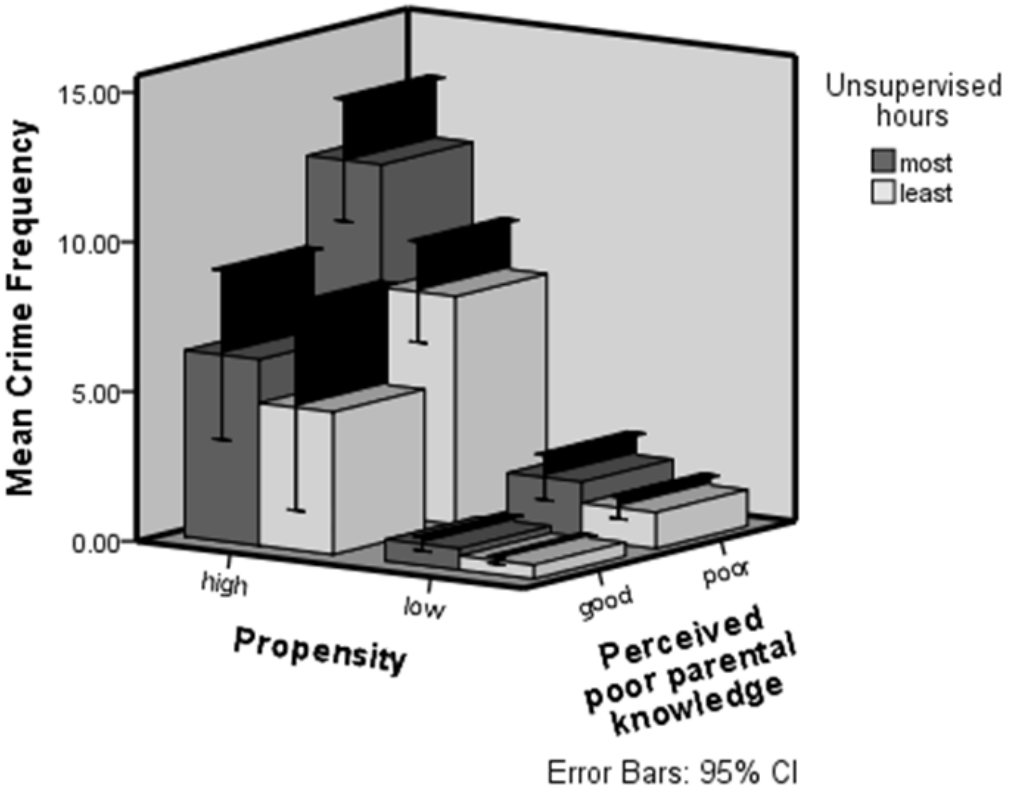
	Coeff.	Robust SE
Perceived poor parental knowledge	.100***	.012
Unsupervised hours	.032**	.010
PPK x Unsup	.015‡	.008
Age 14	.075***	.016
Age 15	.067***	.017
Age 16	.037‡	.019
R^2x100	22.3	

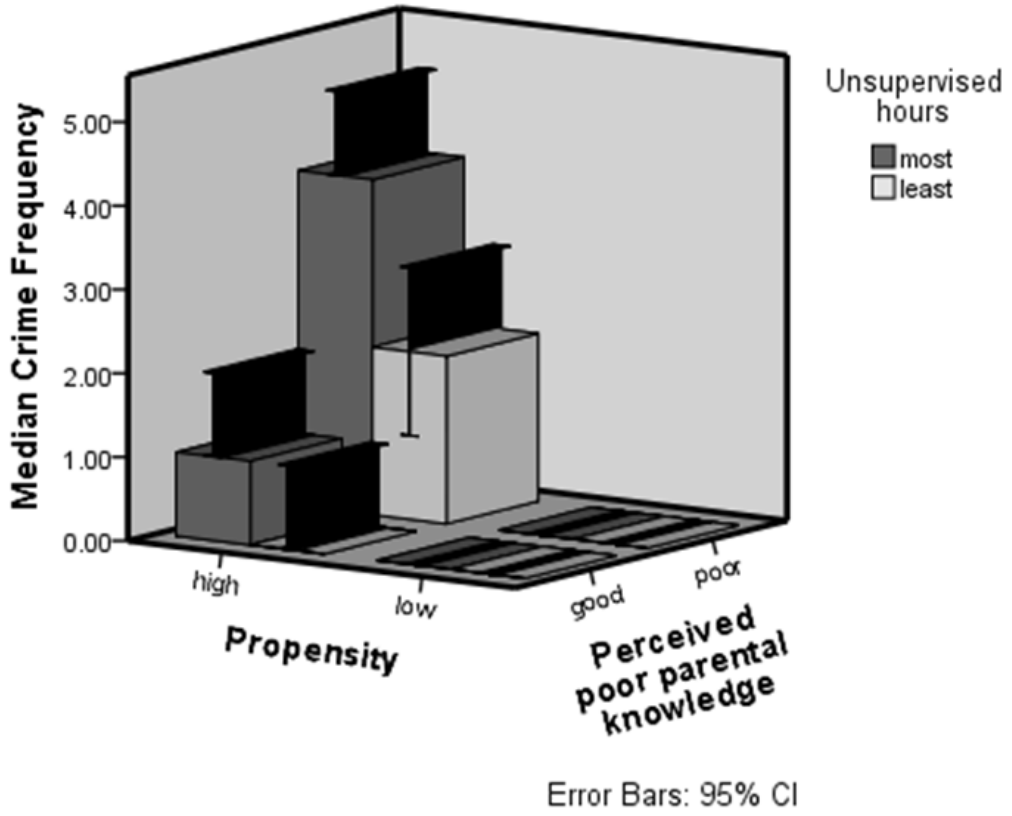
	Coeff.	Robust SE
Propensity	.158***	.015
Unsupervised hours	.028**	.010
Prop x Unsup	.016‡	.008
Age 14	.078***	.016
Age 15	.069***	.017
Age 16	.037*	.018
R^2x100	34.6	

‡ p<.10; * p<.05; ** p<.01; *** p<.001.
PPPK = Perceived poor parental knowledge; Prop = Crime propensity; Unsup = Unsupervised hours;
All independent variables are z-standardised, as is necessary before assessing interaction (Aiken & West, 1991).

The evidence from fixed-effects models provides an unconvincing picture of interaction (Table 17 and Table 18). However, graphical representation of group crime frequency means and medians (and their confidence intervals) provide stronger evidence that perceived parental knowledge, unsupervised hours and crime propensity interact (Figure 14).

Figure 14: Graphs of group mean and median crime frequency by three dichotomised intersected variables (crime propensity, perceived poor parental knowledge and unsupervised hours), pooled person-year data.





Graphs in Figure 14 plot the group means and medians of the dichotomised variables using pooled annual data. These graphs show similar findings to the same graphs in Figure 13 (page 281, which instead show averages for summed age 13-16 variables). The comparable means and medians depict that individual levels of crime propensity, unsupervised hours and perceived poor parental knowledge interact in their relationship to individual crime frequency. This three-way interaction and all findings in this chapter are discussed in the following section (section 9.3:).

9.3: Summary

This chapter presented analyses of statistical interaction between individual level independent variables (generalised crime propensity, generalised perceived poor parental knowledge, number of hours spent unsupervised) in the prediction of individual crime frequency. Overall, findings generally support the conclusion that there is a three-way dependency effect evident in the data. Descriptive representations of the data guide the interpretation of this statistical interaction.

A person's perception that their parents' knowledge about the circumstances of their unsupervised activity is generally poor is related to a higher individual crime frequency. However, this relationship is most pronounced amongst those who are most often unsupervised. This is evidence of a dependency effect whereby the effect of the level of exposure to one criminogenic feature of settings (psychological absence of parents) on crime frequency is dependent on exposure to another criminogenic feature of settings (physical absence of guardians). Furthermore, findings show that the effect of this dependency is most apparent amongst those participants who are generally crime prone. This means that the effect on an individual's crime frequency of exposure to parental monitoring related criminogenic features of settings is dependent on whether the features of that individual are also criminogenic. In general terms, this finding replicates findings in support of an interaction between crime propensity and criminogenic exposure at the level of individuals (e.g., Kroneberg et al., 2010; Svensson & Pauwels, 2010; Wikström, 2009; Wikström, Oberwittler, et al., 2012; Wikström & Svensson, 2008).[22]

Not all the interaction terms relevant to this conclusion are significant in all models presented in this chapter; however, taken together, the evidence presented here generally supports this interpretation of results. Demonstrating statistical interaction in data is notoriously difficult,

[22] In this case, the absence of guardians and generalised perceived poor parental knowledge are the only elements of criminogenic exposure captured, so it is an important finding that this interaction holds even with such a broad definition of criminogenic exposure.

particularly when the dependent variable is skewed (see further section 7.2:), and when problematic random variation is not smoothed by summing variables over time or aggregating individuals into groups. Furthermore, some small groups of individuals may hinder reliable comparison of average crime rates. Therefore, the approach of this conclusion is to interpret the overall picture of results rather than any specific finding. A number of significant statistical interaction terms in various models and significantly different group averages together provide an overall picture of statistical interaction.[23]

Whilst analysis at the level of individuals allows us to conclude that the absence of guardians and perception of parental knowledge is important for the behavioural outcomes of particular kinds of individuals, it is difficult to assess the process by which it is important. Time spent unsupervised and a generalised perception of poor parental knowledge (and their inverse) may influence longer term processes of development and change, as well as the more short term situational process. The main limitation of the findings presented in this chapter is that the analyses are conducted at the individual level using additive methods which means that they can't evidence the situational process (chapter 7). For example, it cannot be determined from these analyses whether acts of crimes most commonly occur when crime prone adolescents are unsupervised and believe their parents don't know where they are, who they are with or what they are doing. Despite this limitation, the findings of this chapter correspond to effects and relationships we would expect to see at the individual level if the situational process were functioning as hypothesised in chapter 6. The analysis in the next chapter allows us to determine whether guardian status and perceived parental knowledge is specifically important for contexts of action (as opposed to contexts of development).

[23] There is scope for additional tests of statistical interaction in this data, including additional methods described in section 7.2: (e.g., SEM and MPLUS models). Since this study has situational data that is analysed situationally in the following chapter, the employment of these additional methods was not deemed necessary in this study of situational interaction.

10 Situational interaction

The analytical approach of this empirical chapter is to describe the situational (convergent) conditions under which an act of crime is more or less likely. The most appropriate analysis is one conducted at the level of the situation. Situational analysis is discussed in detail in chapter 7. Some of the analyses in this chapter appear similar to those in the previous chapter; however, the level of analysis in this chapter is the situation and not the individual. This makes these analyses very different because they can provide evidence of situational interaction, whereas the previous chapter can only demonstrate a statistical dependency. The hypothesis laid out in section 6.3.2:. represents the culmination of the main questions raised by the application of the situational model of SAT to particular features of parental monitoring. Evidence of situational interaction is evidence that supports the proposed situational mechanism described in chapter 6 as an explanation of the relationship between the presence of guardians and perceived parental knowledge and acts of crime.

In this chapter, the units of analysis are hours, which capture the intersection of people (and their characteristics and features) and settings (and their characteristics and features). This data is not nested within persons, environments or years because it is the features and characteristics of the situation that is relevant for evidencing situational mechanisms, not how, where, or why the particular convergence of those particular conditions came about. The purpose of the analyses in this chapter is not to evidence statistical interaction, but to evidence which intersections of personal characteristics and environmental features are most criminogenic. Data about the hour units is collected using the Space-Time Budget and is combined with individual level data from other parts of the PADS+ interview (see chapter 8). This situational data structure means that these hour units can be used to conduct truly situational analysis (chapter 7). The analyses in this chapter calculate crime rates per thousand hours under particular conditions (section 7.3.2:). This allows comparison of crime rates for situations characterised by different levels of crime propensity and perceived parental knowledge and by the presence or absence of guardians. A clear way to depict these differing crime rates is to graph them. These rates of crime under different conditions are compared by attention to their ratio (as a measure of effect size), and statistical (non)significance is also reported via a two-proportion χ-test (section 7.3.2.1:). These rate comparisons afford conclusions about the intersection of key individual and environmental features and the relationship of these situational features with crime events.

The empirical findings presented in sections 10.1: and 10.2: of this chapter are summarised and discussed in section 10.3:.

The analyses in this chapter build to ultimately address the full convergence of crime propensity, perceived parental knowledge and the presence or absence of guardians. Section 10.1: addresses the criminogenic effect of perceived parental knowledge and the presence or absence of guardians on settings. The additional condition of crime propensity is added to analyses in section 10.2:, but it is not until section 10.2.4: that the effect on the hour level crime rate of convergent conditions of crime propensity, perceived parental knowledge and the presence or absence of guardians is assessed. Crucially, it is only this analysis that can determine whether situational interaction is evidenced among the parental monitoring factors under study.

10.1: Guardian status, perceived parental knowledge and crime

This section describes the relationships at the hour level between the presence or absence of guardians, level of adolescent perceived parental knowledge, and acts of crime. These conditions aim to capture the physical and psychological presence of parents and other guardians (section 6.1:).

This section describes the hour level criminogeneity of the presence or absence of parents and other guardians (10.1.2:) and of individual perceived parental knowledge (10.1.3:). This section aims to assess the data for evidence of the situational mechanisms purported to link these conditions to acts of crime (see section 6.2:), so the effect on crime of their convergence is described in section 10.1.4:, which suggests that the effect of a general perception of poor parental knowledge of the circumstances of unsupervised activity is only relevant to the rate of crime during hours that are unsupervised.

First, section 10.1.1: describes the effects of selection effects on the distribution of hours into conditions defined by the intersection of the presence or absence of different kinds of guardian with different levels of individual level perceived parental knowledge.

10.1.1: Guardian status and perceived parental knowledge

Analysis in chapter 9 showed at the individual level that time spent unsupervised and perceived poor parental knowledge are positively related. In comparison to the measure of guardian status used in chapter 9, which aggregates the number of hours spent unsupervised to each person; hour level analysis allows the distinction of the presence or absence of parents and other guardians in each setting. All participants combined spent 167,420 hours awake during the ages

13-16, and these hours represent the hours available for analysis in this chapter (section 8.2.2:). Table 19 details the percent of these total (awake) hours by each condition of guardian status, and the generalised level of perceived parental knowledge of the participant who spent that hour. Table 19 shows that children who generally perceive that their parents know least about their activities when they are unsupervised also spend more time unsupervised, and also that parents who are most often physically present with their children are generally perceived to know the most about their children's activities when they are unsupervised.[1] The proportion of time spent in the presence of guardians other than parents doesn't vary as much by the level of perceived parental knowledge, which is perhaps driven by the fact that the vast majority of time spent in the presence of other guardians is spent at school (section 8.2.2.2:). Although school attendance may vary to some degree, school attendance is still a legal requirement at this age and there is less opportunity for the amount of time spent at school to vary across individuals.

Table 19: Percent of total hours awake (all participants) by guardian status and level of perceived parental knowledge

Perceived parental knowledge	**Guardian status**			
	Parents present	Others present	Unsupervised	All hours
Good	51.5	32.4	16.1	100.0
Medium	46.6	33.4	20.0	100.0
Poor	41.8	30.3	27.9	100.0
All people	46.8	32.6	20.6	100.0

One of the difficulties encountered in the previous chapter was that due to strong relationships between intersecting variables, the selection of individuals into groups based on those variables was uneven (see section 9.1.2:). In some cases, the groups became too small for analysis. This is also a potential problem for situational analysis. Although the crime rate method used in this chapter takes account of the differing amounts of exposure of particular individuals to particular settings, selection effects mean that certain situations may be infrequent. This may cause a problem for some calculations and comparisons of particular crime rates, particularly when additional conditions are specified. However, despite the relationship between guardian status and level of parental knowledge, even participants who perceive their parents to have a good deal of knowledge about the circumstances of their unsupervised time still spend almost a sixth of their time unsupervised (Table 19). Being unsupervised is not particularly unusual for most participants, though they do spend the bulk of their time in the presence of guardians (section 8.2.2.2:).

[1] When aggregated to the individual level for analyses of the type presented in chapter 9, the rank correlation between perceived poor parental knowledge and unsupervised hours is strong and highly significant each year ($r_s \sim .5$ annually).

10.1.2: Guardian status and crime

Most crimes (77%) are committed when the young person is unsupervised (Table 20; bottom row). It is important to grasp the subtle but crucial difference between the conclusions drawn from analyses of different types of data. In chapter 9 the relationship (bivariate correlation) between individual level aggregated hours spent unsupervised and individual crime frequency affords the conclusion that people who are more often unsupervised generally commit more crime. The situational STB data affords the conclusion that most crimes committed by adolescents happen when they are unsupervised.[2] This difference is crucial for understanding situational processes. Both statements provide evidence that is in line with the expected effects of mechanisms relating to the development of individual crime propensity (e.g., section 5.2.1.2:). Only the second statement allows consideration of the hypothesised effects of being unsupervised on the situational process (as described in chapter 6).

Crime clusters in unsupervised hours, but adolescents are most often in the presence of a guardian. The shaded section of Table 20 shows that although adolescents aged 13-16 only spend a fifth of their time not in the presence of a parent or other guardian, more than three quarters of the crimes they reported took place during this time. This considerable concentration of crime during unsupervised time is reflected in a rate of crimes per thousand hours (2.88; Table 20) that is more than 13 times that of the rate for hours spent in the presence of any guardian (0.22; rate not shown) (rr = 13.19; χ = 15.901; p = 0.00). Only three studies use hour level data to compare rates of offending under different guardian status conditions, though there is no need to report results from two publications that use the same PADS+ data (Wikström et al., 2010; Wikström, Oberwittler, et al., 2012). Bernasco, Bruinsma, et al. (2013) find a less strong difference; they report that the rate of crime during unsupervised time is 6.3 times that of when adult handlers are present.

The difference between the lower rate of crime when parents are present (0.11) and the higher rate when other guardians are present (0.37) (Table 20) is smaller (rr = 3.19) but still significant (χ = 3.058; p = 0.00). This finding is at odds to the only other study of situational data that distinguishes the rate of offending when parents are present from that when other guardians are present; however, it was against even their own expectations that Bernasco, Bruinsma, et al. (2013) found that "adult handlers have a deterrent effect, irrespective of their relationship to the adolescent" (p. 919).

[2] Particular specific individual level questionnaire measures could begin to tap data relevant to this kind of question, but this data would raise methodological concerns and does not allow exploration of the conditions under which crime does and doesn't occur.

Table 20: Crimes per thousand hours by guardian status and perceived parental knowledge

Perceived parental knowledge	Guardian status	Hours		Crimes		Crimes/ '000 hrs
		N	%	N	%	
Good	Parents present	19,295	51.5	0	0.0	0.00
	Others present	12,136	32.4	4	57.1	0.33
	Unsupervised	6,041	16.1	3	42.9	0.50
	Total	37,478	100.0	7	100.0	0.19
Medium	Parents present	46,425	46.6	4	8.2	0.09
	Others present	33,221	33.4	6	12.2	0.18
	Unsupervised	19,905	20.0	39	79.6	1.96
	Total	99,576	100.0	49	100.0	0.49
Poor	Parents present	12,683	41.8	5	6.9	0.39
	Others present	9,199	30.3	10	13.9	1.09
	Unsupervised	8,471	27.9	57	79.2	6.73
	Total	30,366	100.0	72	100.0	2.37
All	Parents present	78,403	46.8	9	7.0	0.11
	Others present	54,556	32.6	20	15.6	0.37
	Unsupervised	34,417	20.6	99	77.3	2.88
	Total	167,420	100.0	128	100.0	0.76

10.1.3: Perceived parental knowledge and crime

As well as dividing the STB hours (situations) by guardian status, Table 20 also compares the STB hours by the generalised level of perceived parental knowledge of the participant spending those hours. It is clear that crimes are concentrated during hours spent by participants who perceive their parents to have poor knowledge about their unsupervised activities: the rate of crime is 12.69 times that of those with perceived good parental knowledge (χ = 8.30; p = 0.00) and 4.82 times that of those with perceived medium parental knowledge (χ = 9.40; p = 0.00) (Table 20; 'Total' rows).

10.1.4: Guardian status, perceived parental knowledge and crime

The rest of Table 20 compares groups of hours defined by both guardian status and perceived parental knowledge. It is clear that the concentration of crime during unsupervised hours is apparent amongst hours spent by participants with all levels of perceived parental knowledge, but the concentration is much stronger for those hours spent by participants who generally perceive their parents have poor knowledge about the circumstances of their unsupervised activities. For hours spent by participants who perceive their parents to have good knowledge about their activities, the rate of crimes per thousand hours unsupervised (0.50) is not statistically significantly higher than the rate for all hours spent in the presence of any guardian (0.13; rate not shown). This is compared to a dramatic difference among hours spent by those who perceive their parents to have poor knowledge: the crime rate per thousand hours unsupervised (6.73) is

9.82 times higher than that of all hours spent in the presence of any guardian (0.69; rate not shown) ($\chi = 9.71$; $p = 0.00$) (Table 20).

Figure 15: Crimes per thousand hours by guardian status and perceived parental knowledge

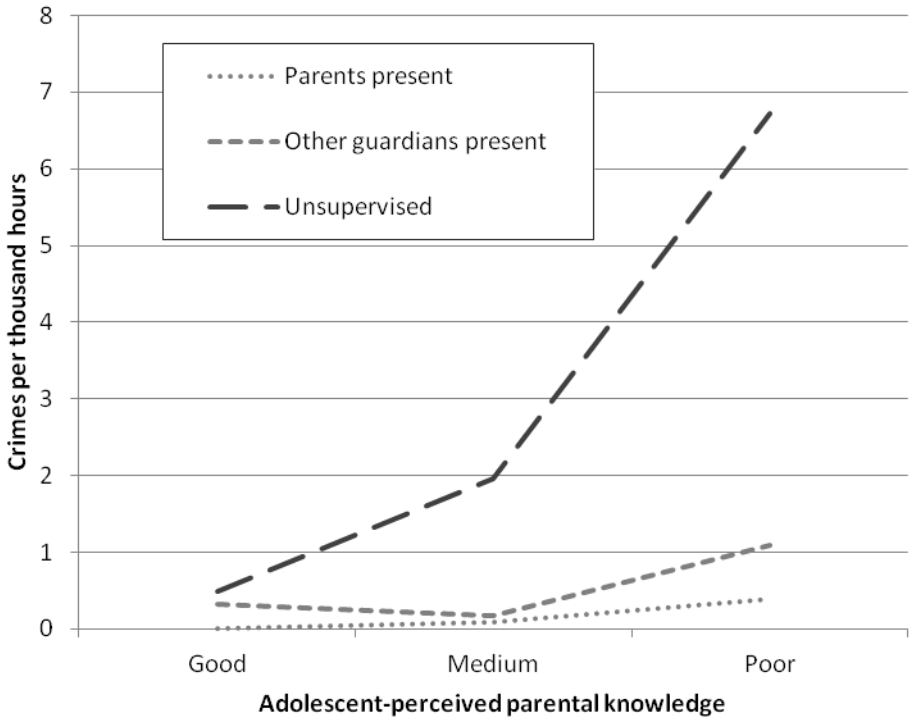


Figure 15 depicts these comparative rates of crime under different conditions of guardian status and perceived parental knowledge, and the graph evidences the criminogenic convergence of the absence of guardians and perceived poor parental knowledge in acts of crime. This is unlike the dependency effect demonstrated in chapter 9 (statistical interaction analysed using Inteff in Table 15 and graphed in Figure 12), which suggests that the criminogenic effect of a person's generalised perception of poor parental knowledge is dependent on their level of unsupervised hours. Instead, Figure 15 depicts comparative crime rates using situational STB data, which affords the more specific conclusion that generalised perceived parental knowledge is only relevant to rates of crime at the hour level when those hours are spent unsupervised.

This finding is in line with expectations about the relationship between measures that aim to capture physical and psychological presence in settings (section 6.1:); however, it is also in line with hypotheses and findings about the role of various family and parenting related variables (for which perceived parental knowledge may be a marker) in the process of personal emergence (section 5.2.1:). Unfortunately, the specific impact of perceived parental knowledge cannot be tested at the hour level because the measure captures a generalised perception of parental

knowledge (section 8.2.1.4:). However, if perceived parental knowledge were only relevant to acts of crime indirectly by being implicated the development of crime propensity (or as a marker for other variables that are implicated in this process), a further effect on crime rate would not be expected once crime propensity is also included as a situational condition. The following section adds crime propensity to the conditions under study at the hour level.

10.2: Crime propensity, guardian status, perceived parental knowledge and crime

The findings in section 10.1: relate to the (hour level) setting conditions under which an act of crime is more or less likely. However, SAT states that it is the interaction between a person (and their features and characteristics) and the environment they are in (and its features and characteristics) that leads to acts of crime. The details of the situational interaction between crime propensity and the physical and psychological presence or absence of parents and other guardians are proposed in chapter 6. Evidence of situational interaction at the hour level would show that the criminogenic convergence of the absence of guardians and perceived poor parental knowledge demonstrated in section 10.1.4: is only criminogenic when those hours are also characterised by high crime propensity.

10.2.1: Crime propensity and crime

A persons' crime propensity is their likelihood of perceiving and choosing crime as an action alternative in response to settings, made up of their law-relevant morality and ability to exercise self control. A bivariate correlation in section 9.1.1: showed that crime propensity is strongly related to crime frequency at the individual level. This relationship is also apparent at the hour level. Low propensity participants reported no crimes during the entire STB study period (4 days annually for 4 years), but the rate of crime per thousand low propensity hours (0.0) increases significantly under conditions of medium propensity (0.34; $z = 2.93$; $p = 0.00$), and again from conditions of medium to high propensity (3.24; $rr = 9.40$; $z = 14.26$; $p = 0.00$) (Table 21; 'Total' rows).

However, SAT is a theory of situational interaction that expects low propensity adolescents to be relatively situationally resistant, while high propensity adolescents are situationally vulnerable to criminogenic features of settings (for discussion and situational empirical findings, see, Beier, 2017; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012). This is assessed for each setting condition next.

10.2.2: Crime propensity, guardian status and crime

First, there is a notable selection effect apparent in the hours characterised by convergent conditions of propensity and guardian status. For example, on average, awake hours spent by low propensity adolescents are half as likely to be unsupervised (14.65%) than hours spent by high propensity adolescents (28.46%) (Table 21). This confirms at the hour level the individual level finding in section 9.1.1: that higher propensity participants spent more time unsupervised.[3] However, being unsupervised is not unusual so this selection effect is not so strong that the crime rate for particular convergences of propensity and guardian status cannot be studied; all conditions of propensity are characterised by some unsupervised hours (more than one sixth of hours spent by low propensity adolescents are unsupervised).

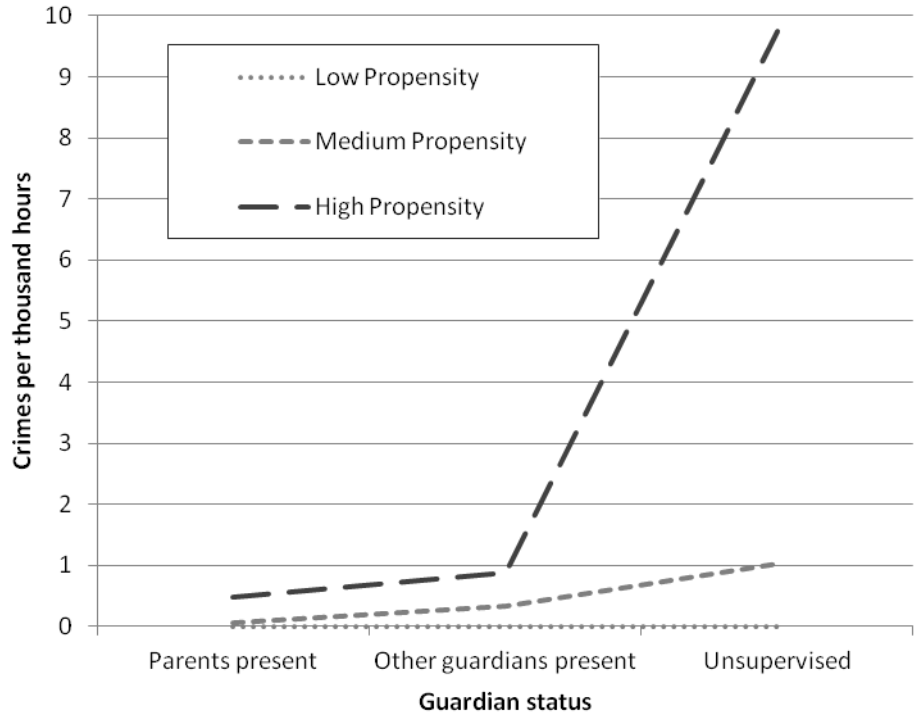
Table 21: Crimes per thousand hours by guardian status and crime propensity

Crime Propensity	Guardian status	Hours		Crimes		Crimes/ '000 hrs
		N	%	N	%	
Low	Parents present	13064	52.5	0	0.0	0.00
	Others present	8190	32.9	0	0.0	0.00
	Unsupervised	3649	14.7	0	0.0	0.00
	Total	24903	100.0	0	0.0	0.00
Medium	Parents present	54473	46.9	3	7.5	0.06
	Others present	38293	33.0	13	32.5	0.34
	Unsupervised	23331	20.1	24	60.0	1.03
	Total	116097	100.0	40	100.0	0.34
High	Parents present	10660	41.1	5	6.0	0.47
	Others present	7902	30.5	7	8.3	0.89
	Unsupervised	7386	28.5	72	85.7	9.75
	Total	25948	100.0	84	100.0	3.24

Since low propensity adolescents do not offend at all in any setting, the guardian status of a low propensity hour has no bearing on the rate of crime (Table 21). By contrast, the rate of crime for high propensity hours is 15.08 times higher ($\chi = 11.65$; $p = 0.00$) when unsupervised (9.75) than supervised (0.65, rate not shown). This criminogenic convergence of crime propensity and the absence of guardians depicted in Figure 16 is evidence of the situational process leading to acts of crime, whereas evidence of statistical interaction between propensity and unsupervised hours in predicting crime at the individual level (see section 9.2.1:; compare particularly with bottom graph of Figure 12) can only evidence developmental processes.

[3] The data used in these analyses is the same, but unsupervised hours are aggregated to the individual level or individual crime propensity applied to the hour level respectively (for detail of these procedures, see section 8.3:).

Figure 16: Crimes per thousand hours by guardian status and crime propensity



10.2.3: Crime propensity, perceived parental knowledge and crime

As evidenced and discussed in section 9.1.3:, there is a strong relationship between perceived parental knowledge and crime propensity at the individual level. When these individual level characteristics are applied to each hour spent by the individual (section 8.3.1:), this relationship is of course reflected in the distribution of total awake STB hours spent by participants with particular propensity and perceived parental knowledge characteristics (Table 22).

Table 22: Total awaken STB hours by participant crime propensity and perceived parental knowledge

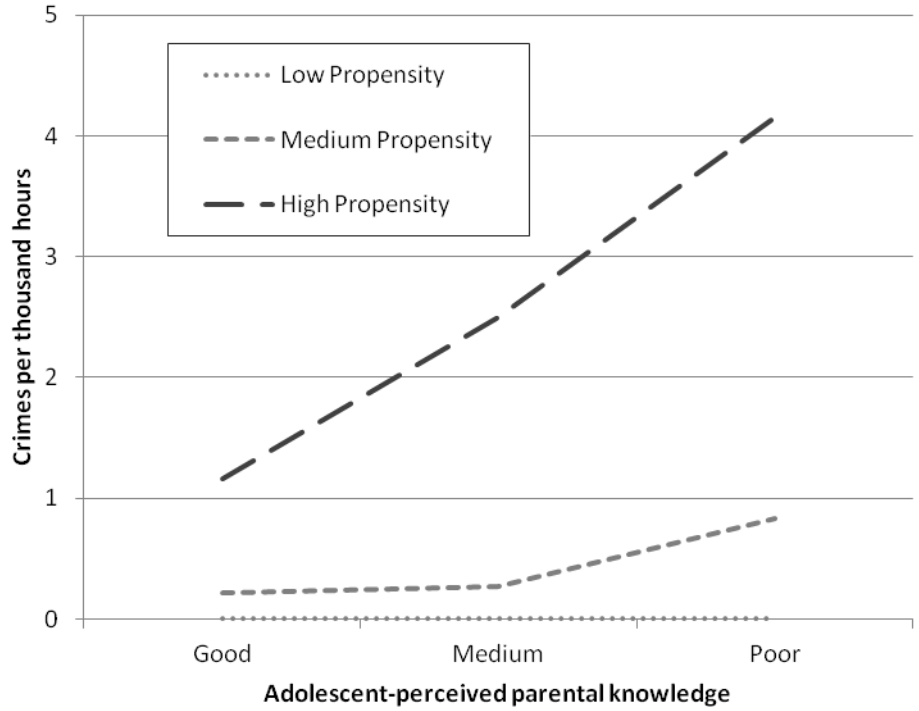
Perceived parental knowledge	**Crime propensity**					
	Low		Medium		High	
	n	*%*	*n*	*%*	*n*	*%*
Good	12883	*7.7*	22806	*13.7*	1722	*1.0*
Medium	11613	*7.0*	76442	*45.8*	11228	*6.7*
Poor	413	*0.2*	16880	*10.1*	13005	*7.8*

The skewed group membership at the individual level (section 9.1.2:) means that a very small proportion of hours were spent by participants who have a low crime propensity but who generally perceive their parents to have poor parental knowledge about their activities when they are unsupervised. However, there are still 413 hours under these convergent conditions. The

other small group, comprised of hours spent under conditions of high propensity and perceived good parental knowledge, amounts to 1,722 hours (Table 22).[4]

Although both characteristics were measured at the individual level, comparative crime rates at the hour level are shown in the 'Total' rows in Table 23 (page 300) and graphed in Figure 17. These confirm that convergence of high crime propensity and perceived poor parental knowledge at the hour level is criminogenic. The criminogenic effect of perceived poor parental knowledge is not apparent in hours characterised by lower crime propensity.[5]

Figure 17: Crimes per thousand hours by perceived parental knowledge and crime propensity



[4] The group of hours defined by conditions of medium propensity and perceived medium parental knowledge is the largest due to the method of categorisation of these variables at the individual level. For a discussion, see section 9.1.2:.

[5] No other situational studies address perceived parental knowledge; therefore no further comparable findings are reported.

10.2.4: Crime propensity, guardian status, perceived parental knowledge and crime

Only by studying the effect on hour-level crime rates of the convergence of crime propensity, perceived parental knowledge and the presence or absence of guardians can the situational role of these conditions in acts of crime be evidenced.

To understand any relationship between perceived parental knowledge and crime that remains after crime propensity is taken into account, Table 23 shows the hours analysed in Table 21 (i.e., split by guardian status and perceived parental knowledge), but this time also split by the propensity of the person spending those hours.[6] This large number of rate comparisons is unwieldy so the following analysis focuses on the relationships of interest. Table 23 shows that there are some differences in the crime rates between hours when parents are present compared to when other guardians are present. However, in terms of variation by crime propensity, it is the difference between unsupervised hours and hours when *any* guardians are present that is most compelling (see in particular Figure 20, which depicts the crime rates of all 27 groups of hours; see section 12.3: of the appendix, page 333). This is unsurprising due to the convergence depicted in Figure 16 on page 297. For this reason, in Figure 18, the hours spent with parents and other guardians are combined. For reasons of presentation, perceived parental knowledge is also re-categorised into two less extreme groups (based on the individual level annual mean, see section 8.2.1.4:).

Figure 18 depicts crime rates for hours characterised by convergent levels of propensity, perceived parental knowledge, and guardian status. Dashed lines between particular rates denote a significant difference between them, which is described by the risk ratio (where relevant[7]), χ statistic and associated p value (see further, section 7.3.2:). Non significant differences are not marked. Crime is dramatically concentrated in hours that are characterised by the convergence of crime prone individuals in settings that are unsupervised (section 10.2.2:), furthermore, the crime rates during these hours are highest for those that are spent by participants who generally perceive their parents to know least about the circumstances of their activity (Figure 18).

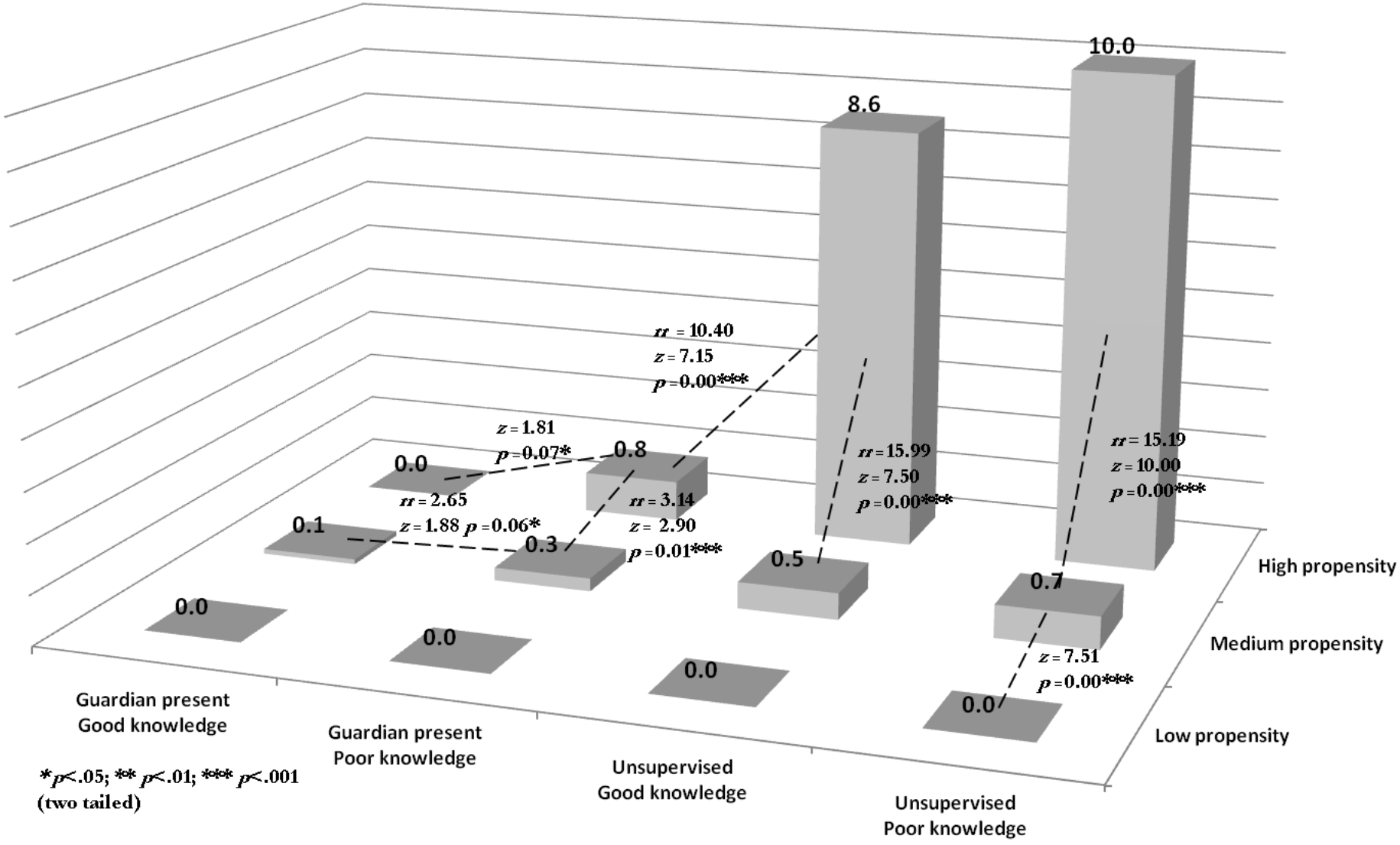
[6] This further categorisation of STB hours creates necessarily smaller groups of hours for analysis (Table 23). These small group sizes are made uneven by the effects of selection processes (see section 9.1.2:). However, there is still variation in guardian status within the groups of hours created by the intersection of individual level crime propensity and perceived parental knowledge. For example, even during the awake hours spent by those who are least unsupervised (i.e., those with low propensity who generally perceive their parents to have good knowledge about the circumstances of their unsupervised time), a still considerable 14% of those hours are spent unsupervised (Table 23).

[7] The conventional method for calculating risk ratios involving zeros is to add 0.5 to each cell and recalculate both probabilities (Deeks & Higgins, 2010; Pagano & Gauvreau, 2000), however, this convention is not well suited to this application.

Table 23: Crimes per thousand hours by guardian status, perceived parental knowledge and crime propensity

Crime propensity	Parental knowledge		Hours		Crimes		Crimes/ '000 hrs
		Guardian status	N	%	N	%	
Low	Good	Parents present	6966	54.1	0	0.0	0.00
		Others present	4174	32.4	0	0.0	0.00
		Unsupervised	1740	13.5	0	0.0	0.00
		Total	12880	100.0	0	0.0	0.00
	Medium	Parents present	5862	50.5	0	0.0	0.00
		Others present	3904	33.6	0	0.0	0.00
		Unsupervised	1844	15.9	0	0.0	0.00
		Total	11610	100.0	0	0.0	0.00
	Poor	Parents present	236	57.1	0	0.0	0.00
		Others present	112	27.1	0	0.0	0.00
		Unsupervised	65	15.7	0	0.0	0.00
		Total	413	100.0	0	0.0	0.00
Medium	Good	Parents present	11447	50.2	0	0.0	0.00
		Others present	7450	32.7	4	80.0	0.54
		Unsupervised	3906	17.1	1	20.0	0.26
		Total	22803	100.0	5	100.0	0.22
	Medium	Parents present	35694	46.7	3	14.3	0.08
		Others present	25616	33.5	4	19.0	0.16
		Unsupervised	15110	19.8	14	66.7	0.93
		Total	76420	100.0	21	100.0	0.27
	Poor	Parents present	7332	43.5	0	0.0	0.00
		Others present	5227	31.0	5	35.7	0.96
		Unsupervised	4315	25.6	9	64.3	2.09
		Total	16874	100.0	14	100.0	0.83
High	Good	Parents present	839	48.7	0	0.0	0.00
		Others present	491	28.5	0	0.0	0.00
		Unsupervised	392	22.8	2	100.0	5.10
		Total	1722	100.0	2	100.0	1.16
	Medium	Parents present	4739	42.2	1	3.6	0.21
		Others present	3572	31.8	2	7.1	0.56
		Unsupervised	2917	26.0	25	89.3	8.57
		Total	11228	100.0	28	100.0	2.49
	Poor	Parents present	5082	39.1	4	7.4	0.79
		Others present	3839	29.5	5	9.3	1.30
		Unsupervised	4077	31.4	45	83.3	11.04
		Total	12998	100.0	54	100.0	4.15

Figure 18: Crimes per thousand hours by guardian status (two groups), perceived parental knowledge (two groups) and crime propensity

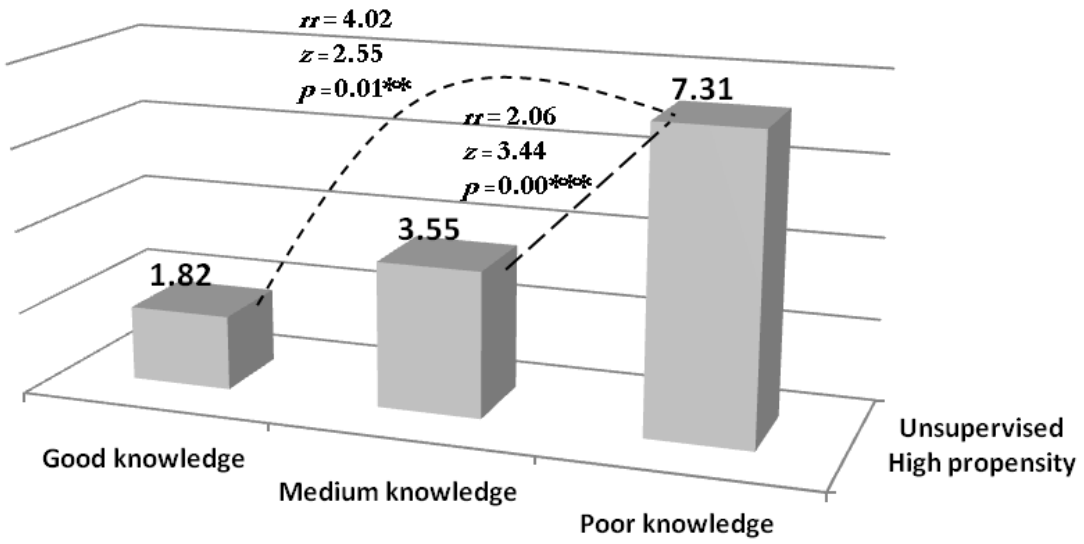


However, this distinction by perceived knowledge is not statistically significant – there is no dashed line between the crime rates for unsupervised high propensity hours that are characterised by good and poor perceived knowledge respectively (8.6 and 10.0; rr = 1.17; z = 0.51; p = 0.61) in Figure 18.[1] This comparison deserves further exploration though because the convergent conditions being compared are very specific, meaning the number of hours available for comparison become small, and the effects of selection processes (see section 9.1.2:) make groups sizes uneven, resulting in some particularly small, but yet particularly interesting, groups (Table 23). For example, out of 166,948 hours spent awake,[2] the STB records only 392 hours that are characterised by convergent conditions of high propensity, perceived good parental knowledge and the absence of guardians (unsupervised) (Table 23). Furthermore, even in the most criminogenic situations, crime is still a relatively rare event. Even with large amounts of STB hours, comparing the rate of rare events across very specific conditions is difficult, and it is surprising that patterns are as clear as they are.

A less extreme definition of individual annual high propensity (dichotomised by the mean, see section 8.2.1.3:) attenuates this problem of small groups of hours for comparison. The crime rate per thousand hours characterised by high propensity and the absence of guardians is now statistically different if perceived parental knowledge is good (2.98) compared to poor (5.63) (rr = 1.89; z = 2.42; p = 0.02; rates not graphed). This differentiating effect of perceived parental knowledge on unsupervised, high propensity hours is also clear when perceived parental knowledge is defined using the more extreme three categories (+/- 1sd) (Figure 19).

[1] The difference between the crime rates for unsupervised, medium propensity hours that are characterised by good and poor perceived knowledge respectively is also not significant (0.5 and 0.7; rr = 1.23; z = 0.39; p = 0.70).
[2] This number excludes the 472 hours that are missing information about any one of the conditions under study.

Figure 19: Crimes per thousand unsupervised high propensity (two groups) hours by perceived parental knowledge



***p<.05; ** p<.01; *** p<.001 (two tailed)**
High propensity = above mean

10.3: Summary

> *"People's crime propensities are triggered by specific environmental inducements, and environmental inducements are made relevant by people's particular propensities (although the relative importance of propensities and inducements may vary by circumstance"*
>
> (Wikström & Treiber, 2018, in press)

Chapter 6 describes *how* the physical and psychological presence of parents and other guardians strengthen the moral context and therefore reduce environmental inducements to offend (for a summary, see section 6.3.1:). Many of the mechanisms described are not observable. This chapter therefore tested hypotheses about effects that would be expected to result from the proposed processes. The situational analyses in this chapter don't analyse variables and their relationship to a crime outcome, but instead describe and compare the (convergent) conditions of hours under which the likelihood of crime varies.

Using measures of the physical and psychological presence of guardians, section 10.1: assessed their impact on the criminogeneity of settings. The physical presence of parents makes settings nearly four times less criminogenic than the presence of any other guardian (section 10.1.2:). This perhaps reflects a generally higher level of investment in and responsibility for a pro-social outcome among parents, which may influence the degree to which different guardians influence the moral context and how it is perceived by the adolescent, which has not been measured in this

study. In addition, this finding is likely to also reflect the generally differing criminogeneity of the kinds of activities and locations of time that is most often spent with particular guardians. For example, time spent with parents is most often in the home in family oriented activity, whereas most time spent with guardians other than parents is spent at school, others homes, sports or social locations, and more often includes the presence of peers. Time spent at home is therefore less criminogenic than in these other locations for additional reasons than the presence of different kinds of guardians (for details of time use by this sample and relative criminogeneity, see, Wikström, Oberwittler, et al., 2012). More research into the nature of time spent in the presence of different guardians will help to delineate particular processes and effects.

Despite the differing criminogeneity of time spent in the presence of different kinds of guardians, crime is still relatively unlikely in the presence of any guardian. In contrast, acts of crime are 13 times more likely during unsupervised hours (10.1.2:). Whilst previous research has shown that 'supervision' is an important part of pro-social developmental contexts, very few studies have shown that the presence or absence of guardians is important for contexts of action. Wikström, Mann, et al. (2018, in press) specifically show that the absence of guardians is a crucial element of action contexts that are criminogenic. The data description in section 10.1.2: isolates the criminogenic effect of the absence of guardians in settings.

The general level of knowledge about their unsupervised activity that adolescents perceive their parents to have (psychological presence) is highly relevant to the likelihood of an act of crime (10.1.3:), though only when those adolescents are unsupervised (10.1.4:). The adolescent's perceived general level of their parent's knowledge about the circumstances of their *unsupervised* activity is almost irrelevant to their rate of crime when they are *not unsupervised*. This is encouraging for a situational explanation of the relationship between perceived parental knowledge and crime.[3] However, the measure of perceived parental knowledge is generalised, meaning that we cannot conclude from this finding that crime is more likely at times when adolescents believe that their parents don't know where they are, what they are doing or who they are with. Combined with a strong individual level correlation with generalised crime propensity, this means that it is unwise to interpret findings about perceived parental knowledge and its role in situational processes without taking crime propensity into account. This is

[3] For example, if a person were never unsupervised, their perceived level of parental knowledge of their unsupervised activity would be meaningless to an explanation of the role of perceived parental knowledge in the criminogeneity of a setting (though it may retain meaning as a marker for factors potentially relevant to social processes).

additionally prudent since a criminogenic effect of perceived parental knowledge on action contexts has not been assessed or demonstrated in any prior research.

Chapter 6 describes the situational mechanisms by which settings are differentially criminogenic for different kinds of people; and section 10.2: tests hypotheses about the effects that are expected to result from the proposed situational process.

No crimes occurred during hours spent by crime averse people, but higher propensity is more criminogenic (10.2.1:). However, the situational model of SAT leads us to expect that individuals are differentially vulnerable to environmental inducements (for prior empirical evidence, see, Beier, 2017; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012).

The first finding to evidence situational interaction in this thesis demonstrates that unsupervised hours have the highest rates of crime when those hours are also under conditions of high crime propensity (10.2.2:). From this finding we can infer that acts of crime are most likely when crime prone people are unsupervised; and crime averse people do not offend, even when they are unsupervised.[4] This finding is contrary to Osgood et. al.'s (1996) extension to Routine Activity Theory which proposes that 'hanging out' (unstructured and unsupervised socialising) is criminogenic for most adolescents, whether they are otherwise prone to crime or not (see also, Haynie & Osgood, 2005).[5]

The criminogenic effect of perceived poor parental knowledge is also only apparent under convergent conditions of high crime propensity (10.2.3:). This is further evidence of situational interaction. This also affirms that a situational role for perceived parental knowledge (as proposed in chapter 6) is plausible because perceived parental knowledge still differentiates rates of crime even when its relationship with crime propensity (and therefore also factors implicated in the development of crime propensity) are taken into account.

[4] The specific finding about the criminogenic convergence of crime propensity and the absence of guardians at the hour (event) level affords this specific conclusion. The analysis of situational data thus crucially increases the specificity of conclusions compared to that of non-situational, individual level data. The most similar finding at the individual level would afford the conclusion that 'the amount of supervision a person experiences is relevant to the amount of crime they commit, but only for certain kinds of people', or similar.

[5] Osgood et al. (1996) actually "do not assume that everyone is equally receptive to the temptations of situations conducive to deviance" (p. 639), but "neither do we [they] assume that exposure to them is relevant only to a small group of "motivated offenders"" (p. 639). Augustyn and McGloin (2013) observe that despite this original statement, "how and why the degree of susceptibility to temptations offered by informal socializing varies has received minimal attention." (p. 118). Interestingly, Augustyn and McGloin (2013) go on to demonstrate (at the individual level) that males and females differ in their susceptibility to the environmental inducements to commit acts of violent and property crime that are associated with hanging out (SAT would expect that much of this gender difference would be accounted for by gender differences in the socialisation and nurturing experiences relevant to the development of personal crime propensity).

All of the crime rates presented in chapter 10 build towards the final comparison of rates under different convergent conditions (section 10.2.4:). This shows that *acts of crime are most likely under convergent conditions of high crime propensity, absence of guardians and perceived poor parental knowledge.* This is confirmed by statistically significant differences between this rate and those for groups of hours that differ in their levels of these key conditions. Future analysis of this data using inferential statistical methods could add to the credibility of this finding. This result is impressively clear considering that the level of specificity of STB data may lead to much random variation, and that all measures could be refined, including those relating to the moral context and crime propensity. This finding and the implications of it are discussed in chapter 11.

PART V: IMPLICATIONS:

What next?

11 Implications

The key empirical finding of this study is that acts of crime are most likely under convergent conditions of high crime propensity, the absence of guardians and generalised perceived poor parental knowledge of the circumstances of activity. The findings provide evidence for interaction between key personal characteristics (specifically, generalised law relevant morality and ability to exercise self control) and features of environments (in this study, aspects of parental monitoring) in the perception-choice process that is proposed by Situational Action Theory to explain action, including acts of crime.

This study addressed the criminogeneity of both the absence of parents and other guardians in settings and an adolescent's generalised perception of poor parental knowledge of the circumstances of their unsupervised activity. Whilst generally criminogenic, these factors are almost irrelevant to crime prevention in the action settings of adolescents who are already crime-averse.[1] This finding suggests that monitoring doesn't always matter.[2] Conversely, the presence of guardians (particularly parents) results in a lower rate of crime among crime prone individuals; and, in an entirely new finding, generalised perceived parental knowledge of the circumstances of activity results in a lower rate of crime among crime prone adolescents when they are unsupervised. These findings are presented in chapter 10.

These parental monitoring-related factors have previously been shown to be related to lower levels of crime. However, these factors are poorly defined in the literature and the mechanisms by which they may reduce crime are inadequately specified (chapters 4 and 5). In addition, key theoretical and empirical insights are generally poorly integrated in criminology; and collecting and analysing situational data is methodologically challenging and misunderstood (chapters 2 and 7). As a result, situational processes that lead to acts of crime are particularly poorly studied. This

[1] This finding is totally at odds with Felson's dramatic but ultimately incorrect statement that "the offender is not the most important actor for explaining crime… those who interfere with offenders, however inadvertently, play an even more central role in crime and its prevention." (1995, p. 53). This study reasserts the centrality of the individual by finding that Felson's conclusion that "the "capable guardian" against crime serves by simple presence to prevent crime, and by absence to make crime more likely" (1995, p. 53) is really only true for some individuals.

[2] Hirschi also suggested that monitoring is only conditionally relevant: "The child supervises himself… Monitoring works for those low on self control. It is unnecessary for those high on self control" (Travis Hirschi, speaking to John Laub; Laub, 2011, p. 319). However, Hirschi over-simplifies the mechanism that links psychological presence with the behavioural outcome by conflating virtual supervision (i.e., psychological presence) and self control. In addition, he also ignores the role of personal morality and moral rules of contexts in guiding behaviour (see further, chapters 5 and 6). Laird, Marrero, and Sentse (2010) also suggest that monitoring may not always be needed for pro-social behaviour outcomes, but they posit a different moderating factor and explicitly reject discussion of a causal mechanism.

study clearly delineates key factors relevant to parental monitoring and focuses on two of the measures that are most commonly related to crime (chapter 4). As far as possible, this study uses situational data about the convergence of particular individuals (and their features) in settings characterised by the presence or absence of guardians and perceived parental knowledge (chapter 8). It conducts situational analyses that are capable of evidencing (and ultimately, do evidence) the proposed process that explains how these parental monitoring-related setting features interact with individual crime propensity to result in an increased or decreased likelihood of an act of crime (chapter 10).[3] This proposed process builds on SAT's perception-choice process by developing the concept of psychological presence in settings and specifying the differential impact of both the psychological and physical presence of guardians in settings on individuals of differing crime propensity (chapter 6).

The approach, contents and contributions of this study are described and reviewed in the summary section (pages 5-11). The focus of this chapter is on the wide-ranging implications of this thesis.

11.1: Implications for crime prevention policy and intervention

A key aim for this thesis is to contribute to a coherent and coordinated knowledge base about the causes of crime, on the basis that this allows policy makers and practitioners to take an explanatory approach to devising cause-oriented crime prevention strategy (chapter 1).[4] Rather than adding further piecemeal evidence, the new conceptualisations and knowledge in this thesis are developed and presented within a strong theoretical framework which means they can be situated in a coherent and coordinated way within the existing knowledge base.[5] Whilst this can't

[3] This thesis also uses non situational, individual level data to assess statistical dependency (chapter 9), with the main aim of distinguishing this kind of data, analysis and conclusions from the situational approach (chapter 7).

[4] Moore (1995) states that "knowing the causes of a problem does not by itself guarantee that one can devise an effective intervention" (pp. 304-305) because intervening in that cause may be inconceivable or unfeasible, politically or financially costly, or have unethical side-effects (see also, Moore, 1983). Whilst policy-making is never simple, the task of devising interventions that are appropriate, affordable and safe is made more possible if they can be effective, efficient, and adequately specified, because then they will offer the best value for money, reduce the costs of crime as much as possible, and have the best chance of avoiding iatrogenic effects. Whilst it is not the task of this thesis to formulate such interventions, the aim is to help furnish qualified policy makers with the adequate knowledge needed to do so.

[5] By not using a broad theoretical framework, many studies of the relationship between parental monitoring and crime do not situate it among other factors in complex causal processes. This means that the impact of parental monitoring on crime is either lost or is made to appear too important relative to other aspects of the causal structure, meaning that recommendations for policy either over- or under-estimate the potential efficacy of parental monitoring prevention measures in relation to other prevention measures. In addition, the nature of the interrelationship of parental monitoring with other features of the causal process must be understood in order to take account of corresponding (potentially problematic) interaction and interrelationship between crime prevention measures.

guarantee improved policy and practice, improvement to crime prevention efforts requires such contributions (chapter 1).[6]

Of relevance to crime prevention policy generally, the findings of this study suggest that parents can influence the situational process that leads to acts of crime by their impact on the moral context of action. Crucially, however; crime propensity of the adolescent is shown to be of most fundamental importance to whether an act of crime takes place or not (because parental monitoring features of settings are irrelevant to the likelihood of crime by crime averse people). This implies that, fundamentally, crime prevention policy should target the development of law-relevant personal moral rules and the ability to exercise self-control in order to have the biggest potential effect on crime.[7] This study replicates the findings of a small but growing number of studies that show that crime averse adolescents are much more resistant to criminogenic features of their environment and are not likely to offend even when exposed to crime conducive conditions (such as the physical and psychological absence of guardians).[8] This finding represents a specific example of the potential of adequate behavioural autonomy, which "encompasses multiple capacities involved with self reliance" (Collins & Steinberg, 2008, p.564). The goal of adolescence is to become autonomous in behaviour and emotions, and thus the main aim for parents is to facilitate adequate autonomy in their adolescents so that they can develop the capacity to function and 'behave ethically' both in the absence of guardians and in the face of external influence such as peer pressure (Collins & Steinberg, 2008). Thus, "the purportedly individual process of developing independence is embedded in the interpersonal contexts of family and peer relationships" (Collins & Steinberg, 2008, p.567); and is therefore a systemic phenomenon. The development of a low crime propensity is part of the development of such autonomy in adolescents and this finding confirms that it is of fundamental importance to the prevention of crime. Policy and interventions that support this development, and support parents, families and other agencies in their interpersonal role in this development, should be a priority for crime prevention.

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[6] As Welsh and Farrington acknowledge, "It is, of course, a well known fact that having convincing research evidence and having it influence policy and practice are two very different matters" (2002, p. 418), however this issue is not for discussion here (see Oliver, Innvar, Lorenc, Woodman, & Thomas (2014) for a health focused discussion of the barriers to and facilitators of the use of evidence by policy makers).

[7] Using a more specific measure of criminogenic exposure that did not aim to assess only parental monitoring, Wikström, Mann, et al. (2018, in press) apply an analytical technique involving machine learning to demonstrate that changing a person's crime propensity would have a much bigger effect on their crime outcomes than changing their criminogenic exposure.

[8] See, Wikström, Ceccato, Hardie, and Treiber (2010); Wikström, Mann, et al. (2018, in press); and Wikström, Oberwittler, Treiber, and Hardie (2012). In addition, Beier (2017) demonstrates the same finding with regards to adolescent alcohol consumption. Haar and Wikström (2010); Pauwels (2018, in press); Wikström et al. (2012) also draw the same conclusion from scenario data about hypothetical behavioural responses to settings.

Of relevance to policy about specifically *situational* impacts on crime, findings suggest that although only true of parents of certain kinds of adolescents, it is still the case that parents can influence the situational process that leads to acts of crime. Data suggests that amongst high propensity adolescents, it is plausible that the physical and psychological presence of guardians strengthens the moral rules and their enforcement in settings to the degree that crime is less likely. The first implication of the situational finding is that in order to reduce crime, the parents and guardians of crime prone adolescents should be supported and encouraged to be present in their settings more (i.e., leave adolescents unsupervised less often).

The finding that crime is particularly likely when crime prone adolescents are unsupervised is demonstrated irrespective of the amount of time these individuals spend unsupervised (exposure). This means that even if a successful intervention reduces the unsupervised time of these crime prone individuals (i.e., they spend more time in the presence of guardians); they might still offend during any remaining unsupervised time, particularly since crime generally doesn't take very long. This problem could be addressed by an impractical and draconian crime prevention recommendation to never leave crime prone individuals unsupervised,[9] but additional findings show that this is not necessary. The finding in this study that crime by unsupervised crime prone individuals is less likely when parents are psychologically present provides an alternative recommendation. Whilst reducing unsupervised time is likely to have a larger impact on crime, the parents of crime prone adolescents should also be supported and encouraged to gain more knowledge about their adolescent's unsupervised activities (and then ensure the adolescent is aware of that knowledge), or improve their adolescent's awareness of existing knowledge. However, arguably this role might be better suited to other individuals and agencies (e.g., schools and key workers) since the parents who most need to improve their knowledge and their adolescent's perception of it are the same parents who were unable or unwilling to support and guide their offspring to develop a strong law-relevant morality and a strong ability to exercise self control.

This is a straightforward translation of the findings of this research into a policy and intervention recommendation that, in short, aims to increase the physical and psychological presence of guardians in the action contexts of crime prone adolescents. However, there is much still to be understood about the role of the psychological and physical presence of guardians in settings for

[9] For example, Felson comes to the rather depressing and restrictive conclusion that "social control in society requires keeping…likely offenders near intimate handlers" (Felson, 1995, p. 54). Not only might we attempt to change the nature of those 'likely offenders', but direct supervision may not be the only solution to reducing the likelihood of their offending.

acts of crime. Without knowing more about these processes, such policy developments may not be fully effective and efficient, or may even risk iatrogenic effects (chapter 1).[10] There are specific ways in which this further research could be particularly effective in its capacity to inform successful crime prevention initiatives.

11.2: Implications for further research

By taking an analytical approach to the study of parental monitoring and crime, this thesis has provided novel findings, important clarifications of concepts, specifications of processes, and recommendations for methods. Much of this is also relevant to the approach and direction of future research.

11.2.1: Approach

The demonstration of situational interaction between individual crime propensity and parental monitoring features of settings in this thesis means that it would not be meaningful for future research to study the criminogeniety of these factors without differentiating their effects on the behaviour of different kinds of individuals.[11] This thesis contributes to existing theoretical argument for and empirical evidence of person-environment interaction in acts of crime (Wikström, 2006; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström et al., 2012; Wikström & Treiber, 2016), and in statistical terms, it is futile to consider main effects in the knowledge that those factors interact (Edwards, 2009). Fragmented research into the causes of crime needs to stop because results can be misleading and result in incorrect policy recommendations. For example, in studies of the criminogeneity of a lack of parental monitoring, an effect may be disregarded or underestimated if assessed across all people; whereas the findings from this study would suggest that an effect might be observable or even dramatic if assessed for

[10] There are a number of existing interventions that target parents' motivation to monitor or their monitoring capacities, or that target the ecology of the family in order to influence monitoring (see, Dishion & McMahon, 1998). The suitability of these has not yet been addressed with reference to the recommendations, findings, and proposed processes presented in this thesis.

[11] For example, the analysis by Bernasco, Ruiter, Bruinsma, Pauwels, and Weerman (2013), allows the authors to show impressive results regarding the relative risk of individuals offending when they are under particular setting and environmental conditions including the absence of guardians; however the analytical strategy, findings and discussion totally ignore existing theoretical arguments and empirical evidence that suggests that such probabilities or rates vary dramatically and systematically according to features of individuals exposed to those settings. Whilst this study cannot be critiqued for not setting out to investigate differential susceptibility or vulnerability (it conducts sound and novel analysis of good quality data, and addresses well the questions it sets out to answer), and Bernasco et al. (2013) state that in order to conduct analyses of individual differences using their selected analytical method they would need a larger sample to retain statistical power; it remains arguably remiss of the authors to ignore empirical findings that render their own only selectively applicable, and unhelpful to conflate situational and non-situational analysis and conclusions.

certain kinds of people. Parental monitoring research in relation to crime must be conducted within a theoretical framework that takes account of situational interaction.[12]

Description of situational analysis in this thesis reveals that some specific conceptual and methodological challenges must be met before future criminological research can embrace the study of individuals in environments (chapter 7). First, collectively, criminologists need to better appreciate conceptual and methodological distinctions; for example, between situation and environment, between 'people and environments' and 'people in environments', or between statistical and situational interaction. Second, there is very little situational data in existence in criminology, and it is currently very expensive and labour-intensive to collect. Criminology must utilise existing situational data collection instruments such as the PADS+ STB more; and also develop a wider range of data collection methods that capture the outcome of the convergence of particular people in particular settings, such as immersive virtual reality technologies. Third, criminologists must look outside the limited regression toolbox for inferential methods that can evidence situational interaction, such as machine learning and other artificial intelligence techniques.

Conducting research within an explanatory framework such as SAT means that implications of research findings such as these can be integrated with those of other research. Whilst the findings imply that 'monitoring doesn't matter' for crime averse people, this conclusion refers only to a direct role of parental monitoring in the situational process that leads to acts of crime. However, features of parental monitoring may be (and have to some extent already been demonstrated to be) very relevant to crime as causes of the causes (i.e., implicated in the social model of SAT). For example, features of parental monitoring can indirectly influence crime due to their effect on processes of emergence and selection (chapter 5). This means that it is important for policy that the situational finding about the conditional relevance of parental monitoring in contexts of action doesn't undermine the potential wider importance of parental monitoring factors for crime prevention. This is a major benefit of policy recommendations made within a broad theoretical framework. Before conclusions can be drawn about the overall significance of parental monitoring to crime, future research should apply the social model of SAT to the study of parental monitoring to allow consideration of questions about which parental monitoring factors affect the development of individual crime propensity, under what conditions, at what age, and for how long; and the nature of the influence of parental monitoring on the selection effects that determine the convergence of kinds of individuals in kinds of settings.

[12] This is true of the many studies that must 'make do' with data that does not truly capture situational interaction.

Although only briefly attempted in chapter 5 with reference to the parental monitoring literature, the continued application of SAT to the previous literature and future study of parenting and crime would provide a more specific role for posited and evidenced mechanisms within an integrated theory of action, thus allowing for some relationships to be conditional or interactive, and explaining and specifying how these complex relationships operate. This endeavour can also identify redundant research into implausible mechanisms, and assign relative importance and structure to the causal order (e.g., causes of crime and the causes of the causes).

This thesis presents an embryonic model of parenting for the purpose of the clarification of parental monitoring constructs (chapters 3 and 4). However, full specification of this nascent model of parenting within the SAT framework would facilitate fuller understanding of the role of parenting factors in both the social and situational model of SAT. A large range of parenting relevant factors including those relating to the family context, parental goals and capabilities, parent-child relationship, bi-directional effects and child agency have been related to crime. Such a parenting model (with testable implications) would help to specify interrelationships between these factors which can then be implicated as causes of the causes in the social model of SAT.[13]

This thesis more adequately defined parental presence and adolescent-perceived parental knowledge and equated these measures with physical and psychological presence. In so doing, it delineated what parental monitoring *is not*. This leaves room for future work to better specify and operationalise these other concepts. For example; parental monitoring features such as parental knowledge itself and knowledge gathering; concepts that are regularly conflated with parental monitoring such as guardianship and supervision; and concepts related to bi-directional effects such as child disclosure and parent-child relations; could all benefit from further study guided by the framework outlined in this thesis.

Before unequivocally making a policy recommendation to increase parental monitoring of crime prone individuals, further efforts should integrate existing relevant research within the broader framework of SAT (and a model of parenting). First, other guardians, individuals and agencies may be better placed to provide this increase than parents who may already be struggling to monitor their children. Integrating these findings with existing or future research on the role of monitoring by people and features of settings other than parents may prove useful in maximising

[13] According to Farrington (2010, 2011), complex interrelations between family risk factors and also between these and other known risk factors for crime (e.g., low income, poor housing, impulsiveness, low intelligence) make it difficult to ascertain the causal mechanisms relating such family factors to crime. However, it is not the complexity of these interactions and relationships that is hampering knowledge about the causes of crime, but poor explication of the mechanisms behind these complex linkages.

the effect and efficiency of a policy or intervention aimed at increasing the monitoring of crime prone individuals. Second, as identified in section 1.2.2.1:, iatrogenic effects can result from interventions devised in the absence of a broad theoretical framework. An increase in guardian presence and perceived parental knowledge may have unintended negative consequences. For example, unsupervised time and the perception that parents are unaware of activities may have developmental benefits, particularly at certain periods during adolescence. Adolescence is a crucial time for the development of autonomy, which may be hindered by a lack of unsupervised discretionary time; and trust between parent and child is potentially important for developmental and action outcomes, and such trust may be fostered by periods of time characterised by a lack of parental knowledge or unsupervised time. In addition, adolescents may vary in their reaction to changes in parenting behaviours such as increases in monitoring levels, and oppressive levels of parental monitoring may result in negative effects on behavioural outcomes.[14]

This thesis marks the beginning of an endeavour to apply a particular worldview and a particular theoretical and analytical approach, and develop conceptualisations and interpret existing and new empirical findings in the study of parenting and adolescent crime. As such, this thesis can inform future study, with the ultimate aim of providing structured and effective recommendations as to what parents can do, and how policy can help them, in the effort to reduce and prevent crime.

11.2.2: Psychological presence

This research set out to study the situational role of parental monitoring in adolescent crime. One of the most novel elements of this thesis relates to psychological presence. The psychological presence of parents was operationalised using a measure of perceived parental knowledge even though this is not the only or even necessarily the best measure of psychological presence. This is because the study of psychological presence was not an original goal of this thesis; rather, perceived parental knowledge was selected for study because it is a measure related to parental monitoring that is commonly associated with adolescent offending but poorly understood (chapter 4), and then psychological presence was identified as a concept relevant to the situational mechanism by which perceived parental knowledge relates to crime (chapter 6).

Psychological presence is a term that was coined and operationalised by Hirschi (1969), but its role in crime prevention was poorly developed. This thesis theoretically developed the concept and applied it to the empirical study of the role of parental monitoring in moral contexts,

[14] There is a balance to be struck - lax and erratic monitoring can be criminogenic, but so can excessive and punitive monitoring (for a discussion, see Seydlitz & Jenkins, 1998).

representing a novel contribution to research (chapter 6). However, before further empirical study of psychological presence, the concept requires further refinement. Insights from the existing literature on perception might benefit the specification of psychological presence and the theoretical discussion about the behavioural and developmental effects it can have. Improved definition would also draw attention to features of settings other than perceived knowledge that might effectively cue psychological presence, and could therefore be used to operationalise it.

The existing operationalisation of psychological presence (perceived parental knowledge) can be improved in future research. This is unsurprising because the PADS+ measure of perceived parental knowledge was not designed to capture psychological presence and its role in the situational process, for which a situational measure of perceived parental knowledge would be preferable (chapter 8). Conclusions using this generalised measure can only state that crime is *more likely* among adolescents who believe their parents to be *generally less aware* of the circumstances of their activity. Perceived parental knowledge data at the level of situations would instead allow analyses to ascertain whether crime is *more or less likely during moments when* unsupervised crime prone adolescents believe that their parents do not know where they are, what they are doing or who they are with. This would allow more specific crime prevention recommendations based on conclusions about the effectiveness of improved perceived parental knowledge, particularly under certain conditions. Such data could be collected as part of a Space-Time-Budget interview,[15] but this would probably need to form part of a specialist study due to the increased time burden of such an addition. Scenarios or virtual reality methods are another way to explore the situational effect of perceived parental knowledge on (intended) behavioural outcomes.

A situational measure of psychological presence would afford the specificity to assess more complex relationships in the data. For example, as adolescents age, the relative nature of the roles of physical and psychological presence may change. Being unsupervised becomes more common with age which means that it is possible that the physical absence of guardians may become less criminogenic (for evidence, see, Janssen, Deković, & Bruinsma, 2014); however, such changes may coincide with a relatively increasing relevance of psychological presence for the likelihood of crime.[16]

[15] The PADS+ STB interview design can accommodate additional questions for each hour regarding whether the participant believed at that time that their parents knew about various aspects of the circumstances of their activity.
[16] In addition, the role of guardians in strengthening the moral context may increasingly be played by other agencies and features of settings, see further below.

This study greatly improved the specification of concepts relevant to parental monitoring, including parental knowledge (chapter 4). However, better understanding of the antecedents of perceived and actual parental knowledge (see also, chapter 4) will improve the specification of recommendations as to the methods by which to increase perceived parental knowledge among unsupervised crime prone adolescents. For example, should parents increase their attempts to gain actual parental knowledge (e.g., via solicitation and control), improve the degree to which their child is willing to disclose information (i.e., spontaneous child disclosure), increase their child's awareness of their existing knowledge (e.g., a well-timed text message), or all of these? If so, by which methods are parents most likely to achieve an increase in perceived parental knowledge? What is the role of technology in gathering and demonstrating parental knowledge? Relatedly, is there a role for the presence of parents in virtual moral contexts that an adolescent may experience concurrently (e.g., when using real time social media online) and how might this be conceptualised and measured? Finally, is there a role for other agents and institutions in improving perceived parental knowledge?

11.2.3: Moral context

This study makes a key contribution to the study of the causes of crime by identifying the criminogeneity of the physical and psychological absence of guardians in settings for crime prone adolescents. Although the situational process of perception and choice by which crime prone people are vulnerable to this specific criminogeniety was developed theoretically (chapter 6), the specifics of this process were not directly tested in this initial study. This lack of empirical specificity hampers the specificity of crime prevention recommendations. Although already more specific than any previous research on the situational role of parental monitoring in crime, this research does not distinguish between the guidance role of guardians in their influence over the moral rules of settings and the controlling role of guardians in their deterrence of acts of crime in settings, and therefore cannot directly test which aspects of presence are important for the criminogeneity of which features of settings. Does the physical or psychological presence of parents or guardians in settings strengthen perceived moral rules, increase the perceived likelihood of detection and sanction, or both? Better conceptualisation of 'supervision' may provide insight here (see section 4.3:); ultimately however, improved measures of different aspects of moral contexts are required to distinguish the impact of the physical and psychological absence of guardians on the moral rules of settings from their impact on the enforcement of moral rules.

The PADS+ STB methodology could be adapted in future specific parenting studies to better measure parenting practices and parenting-related measures of the moral context. This would allow better specification of what effect physical and psychological presence actually has, and the kinds of features of settings that might be relevant to cue psychological presence. However, there is a danger that the already very intensive STB interview could become burdensome, or that asking about these very specific features might bias the respondents' report of them. Further research could explore the suitability of other methods for capturing these specifics of moral contexts. For example, Dishion and McMahon (1998) report on direct observation methods for capturing parental monitoring practices; however the presence of a researcher is likely to alter the context too much to reliably assess the effect of the presence of others in settings.

More innovative methods could also be investigated. For example, an EAR (Electronically Activated Record) is a small wearable digital audio-recorder that unobtrusively collects naturalistic real-world data about the interactions and contexts experienced by individuals in their daily lives (Bollich et al., 2016; Mehl, Robbins, & große Deters, 2012). The method is "optimized for the objective assessment of audible aspects of social environments, behaviors, and interactions (e.g., habitual preferences for social settings, idiosyncratic interaction styles, and subtle emotional expressions)" (Mehl et al., 2012, p. 410). A more experimental approach could be to use wearable immersive virtual reality technologies to expose participants to built and manipulated interactive environments that could tap into various specific features of the presence of guardians and measure their effects on virtual behaviour.

Future research could explore and take account of the variability of parents and guardians. Related to this is the question of whether the psychological presence of any kind of guardian (and not just parents) is effective. Different individual guardians and different kinds of guardians are differentially capable of and motivated to influence the moral rules and their enforcement in settings in order to prevent crime by their children or charges. For a broad range of reasons, guardians vary in their investment in and responsibility for the child, their dyadic relationship with the child, their own moral rules, their parenting goals, and the efficacy with which they can guide and deter the behaviour of their adolescent (see e.g., section 4.2.3.2:). Although this study does not take these factors into account[17] other than to distinguish between the physical presence of parents and other guardians, the theoretical model does not assume heterogeneity among all

[17] Preliminary assessment of the scale of any effect of this suggested only small variation in parental goals for adolescents (section 4.2.2.1:); and analysis of parental moral rules in section 6.2.2: also showed that parents vary less in their moral rules than adolescents.

parents, all guardians and all kinds of guardians. If data allows, any variation between guardians could be accounted for in future analyses.

This study finds that the absence of guardians is an important part of criminogenic exposure, for certain kinds of individuals (with higher crime propensity), at least, for individuals aged 13-16. The criminogeneity of unsupervised time undoubtedly changes after this time (see, e.g., Wikström, Treiber, et al. Forthcoming). Adults are not usually directly supervised in their day to day lives other than perhaps at work, so as adolescents mature into adulthood the absence of parents becomes normal and ceases to be so criminogenic, even for crime prone people.[18] The role of parents and other guardians in strengthening the moral context may be increasingly played by other agencies and features, and also the relative importance of environmental inducements may reduce.

Building on the findings of this study, research into the role of the physical and psychological presence or absence of parents and guardians could include analysis of other influences on the moral context, such as the presence of peers. Unsupervised (and unstructured) time spent alone is not criminogenic (Flannery, Williams, & Vazsonyi, 1999; Pettit, Bates, Dodge, & Meece, 1999; Wikström et al., 2012); crimes by adolescents are commonly committed in the presence of peers (McGloin, Sullivan, Piquero, & Bacon, 2008; Reiss & Farrington, 1991; Warr, 1996; Wikström et al., 2012); and peers are particularly influential in settings (Coleman, 1961; Harris, 1998; Hirtenlehner & Hardie, 2016; Warr, 2002; Wikström et al., 2012). Together this evidence raises questions for future study about peer influence, and specifically about the counteracting influence of crime averse guardians and crime prone peers on the moral context. In particular, the extent to which the psychological presence of some people can counteract the physical presence of other people in settings could be a subject of future study.

Capturing the nature of these and other additional features of contexts would allow generally better measures of exposure to criminogenic contexts. These measures would benefit from being continuous, which might be more possible when capturing more nuanced features of settings. Continuous variables pertaining to moral contexts would facilitate more statistically sophisticated analysis, for example, regression analysis of the distribution of crime rates (see, Hilbe, 2011), or machine learning techniques such as those employed by Wikström, Mann, et al. (2018, in press) applied to only continuous data rather than any binary measures.

[18] Of course, the criminogeniety of unsupervised time may also change to some extent during the period when adolescents are aged 13-16 (for example, due to the changing intensity of supervision and proximity of the supervisor to the supervisee. See further section 4.3:). This is not assessed in this study, but could be in future research if the data were specific enough (see above, section 11.2.2:)

Finally, by using SAT's definition of crime (section 2.1:), the situational explanation of crime involving perceived parental knowledge and the presence of guardians in this thesis is also applicable to an explanation of moral rule-breaking in general. This includes other behaviours commonly addressed in the parental monitoring literature. In addition to offending, the PADS+ STB also captures alcohol and substance use; involvement in arguments, harassment, or provocation; and weapon carrying.[19] This data could be analysed using an identical approach to that presented in this thesis.

11.3: Implications for responsible society

The findings and approach of this thesis have specific implications for crime prevention recommendations and further research. There are also broader implications of this thesis for how we treat parents and adolescents, and broadly how we approach crime prevention. These are outlined here as thinking points.

A main goal of adolescence is to become self reliant (autonomous) in the absence of guidance and monitoring and also in the face of external influence (chapter 3). This development of independence is embedded in the interpersonal contexts of family and peer relationships (Collins & Steinberg, 2008). One of the main responsibilities of parents is to prepare offspring to be able to act autonomously (behavioural autonomy), and connect with others (emotional autonomy) (chapter 3). Offending represents a failure in law-relevant behavioural autonomy. Many intervention programmes focus directly on the parents of offenders, aiming to change parenting behaviour in a way that will reduce offending in the child. Parents of offenders are often blamed and sometimes even punished for the crimes of their children (Arthur, 2005; Bessant & Hil, 1998; Dundes, 1994; Le Sage & De Ruyter, 2008; Solomon, 2013). This thesis has focused on what parents can do to prevent adolescent crime, but this does not mean that it advocates making parents legally responsible for the crimes of their children.

Acts of crime are committed by individuals who have agency. Parents can be guilty of being neglectful or failing in their responsibility to guide the development of pro-social behavioural autonomy in their children (see also, Le Sage & De Ruyter, 2008); but ultimately it is the child who offended.[20] Child agency and the role of children in the dynamic interplay between parents

[19] The PADS+ STB also captures data on participants' experience of these events as a witness or victim, which might also be analysed in a similar way within the SAT framework. However, events experienced by participants are a different kind of outcome to acts by participants and therefore require an alternative explanation.

[20] Le Sage and De Ruyter (2008) conclude that "parents can be blamed for the crimes of their children, not because they have the duty to control their children as is often maintained, but because they have the duty to assist their child

and children should not be ignored (Fletcher, Steinberg, & Williams-Wheeler, 2004; Keijsers, Branje, VanderValk, & Meeus, 2010; Kerr & Stattin, 2003; Kerr, Stattin, & Özdemir, 2012; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006; Stattin & Kerr, 2000; Tilton-Weaver et al., 2010). Critics of the punishment of parents for the crimes of their children argue that parental culpability is mitigated by economic disadvantage (Rodman & Grams, 1967; Wilson, 1980), and research suggests that particular barriers to effective parenting have their genesis in structural and contextual factors (Patterson, 1996; Sampson & Laub, 1993); however, although they may have been 'failed' by society, parents are still responsible for their actions as parents.

Many children are 'failed' by their parents, and many parents are 'failed' by society, but not all of these children offend, and not all of these parents neglect or fail in their parenting responsibilities. Individuals are responsible for their own actions – children for acts of crime, parents for parenting – and not the actions of others.

This thesis adds to recent evidence in support of SAT. These findings provide specific evidence that to change the behaviour of young people we should aim to guide them rather than control them. Although they did not directly evidence why, Seydlitz and Jenkins (1998) also argue this and conclude that "it is time to change how the world treats children in order to change their behaviour" (p. 87). Criminology has been preoccupied with control (chapter 5),[21] but the discipline should focus more on morality in order to provide more effective crime prevention recommendations. The moral rules of individuals and the moral rules of settings guide behaviour, and internal self control and external deterrents serve to control behaviour only when this moral rule guidance is in conflict. Society, including parents, should be guiding children first and only controlling when necessary. This means that to have the biggest impact on crime, agencies and institutions including parents should focus primarily on the development of law-relevant personal moral rules in children, and on ensuring that the contexts to which they are exposed have strong law-relevant moral rules. Attempts to nurture their ability to exercise self-control and enforce law-relevant moral rules in settings to which they are exposed are not irrelevant, but since the effects of controls are conditional these attempts should be secondary.

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to develop in such a way that s/he becomes a morally competent agent" (p. 789). Arguably however, parents should only be blamed (and potentially held criminally responsible) for their parenting failures in this regard rather than held criminally responsible for the actions of another person.

[21] This preoccupation is to the extent that some researchers are often not aware that they are working within the control paradigm; and others view everything through the lens of control (e.g., Britt and Rocque (2016) state that morality in SAT *is* control, and cannot appreciate the distinction between guidance and control).

11.4: Final summary

Offending in adolescence is often seen as inevitable and yet a large proportion of adolescents do not offend (Wikström et al., 2012), so another way to frame the study of parental monitoring and crime is to start by aiming to explain action, and ask by which mechanisms parental monitoring can prevent crime.[22] The book 'What can parents do?' starts by listing the key ways in which research into the role of parents in adolescent problem behaviour needs to change. These are; "a clarification of constructs used", "the use of new research tools" and "the emergence of new theoretical perspectives" (Kerr, Stattin, & Engels, 2008, p. 4). In order to adequately address the situational mechanisms by which parental monitoring can prevent crime, this research has identified and overcome such conceptual, methodological and theoretical challenges.

This thesis further specified and empirically evidenced SAT's situational process to contribute to wide-ranging existing evidence that parents are key agents for crime prevention. However, this thesis has further developed the argument that in order to maximise this effectiveness of parents in crime prevention, criminological research must aim to study the causes of crime, and the causal mechanisms by which these causes have effect. This approach requires this research to address the interaction of individuals with their environments and to integrate such situational findings with complementary theorising of and research into the causes of those causes. In order to evidence causes in this way rather than identify risk, this research takes a theory-driven analytical approach.

By using an innovative research instrument and specialised analytical method to capture the role of strictly defined constructs in newly specified theoretical processes, this thesis is a case study of analytical research into situational interaction and parental monitoring that makes contributions to both crime prevention recommendations and the advancement of criminological research methods.

[22] This study has often focused on the causes of any behavioural response that doesn't involve crime, rather than the causes of crime. For example, the emphasis has often been on the role of the psychological and physical presence of guardians in strengthening the moral context and the resultant lower crime rate. Crime is a rare event, even among adolescents. Often, one of the best ways to study the rare is to study the normal. For example, Maslow believed that one cannot understand mental illness until we understand mental health (1954).

BACK MATTER

12 Appendix

12.1: Crime prevention 'successes' in context

Hotspots Policing, Restorative Justice, Situational Crime Prevention and Multi-Systemic Therapy are interventions that are often cited for their crime prevention successes. However, these examples are used in this section to illustrate the limits of 'making do' within criminology. The latter two of these intervention approaches are each summarised below, followed by a discussion of each that concludes that neither solve the problem of crime and both are characterised by inefficiencies or potential unintended effects.

First, the premise of Situational Crime Prevention (SCP) was adopted and largely developed by Clarke and colleagues (see, for example, Clarke, 1980, 1983; Cornish & Clarke, 2003). SCP itself is not a theory of crime causation but an approach to crime prevention, and although Clarke rooted SCP in three theories (rational choice theory, routine activity theory, and crime pattern theory), such opportunity theories are actually just perspectives that provide axiomatic statements about crime and heuristic devices describing the conditions leading up to crime, and are not explanations of the causal processes involved in crime (Bouhana, 2013, pp. 2-3; Cornish & Clarke, 2008, p. 44; Wikström, 2011, p. 61). SCP is (and is self-professed to be) unconcerned with theory or empirical truth and instead is intent on finding practical techniques and methods to prevent crime.[1] Proponents of SCP use the term *'good enough theory'* to refer to its underlying 'theoretical' approach, which has developed in a fragmentary yet practical way in response to the focus on practical prevention measures (Cornish & Clarke, 2003, p. 86; 2008, p. 38; Smith & Clarke, 2012, p. 292). SCP has been shown to successfully prevent crime by, in the main, reducing opportunities for offending (see, for example, Clarke, 1997; Felson & Boba, 2010; Guerette, 2009). In sum, SCP is a quick (and relatively cheap) fix that takes a problem solving approach, aims to provide technological solutions, and has achieved some practical successes. This means it has proved popular with crime prevention policy makers and practitioners who are 'making do' in the absence of knowledge about the causes of crime. Put more agreeably, SCP

[1] SCP is included within the research area of 'crime science', which is perhaps misleadingly named because it acknowledges itself to be an engineering-focused discipline that prefers short-term problem-solving to scientific exploration of cause and effect (Bouhana, 2013; Laycock, 2005).

"offers a broad repertoire for preventing crime here and now, rather than there and eventually" (Felson & Boba, 2010, p. 199).

Second, Multi-Systemic Therapy (MST) is a type of intervention aimed at reducing offending which recognises the complex nature of the causes of crime and targets both existing individual characteristics and also some kinds of proximate environmental factors (see, Wikström & Treiber, 2008 for an overview). These factors are typically identified from risk factor research. MST delivers multiple interventions both to the individual (through cognitive behavioural therapy) and within a range of settings and contexts (e.g., family, peer, school and neighbourhood) (Borduin, Schaeffer, & Ronis, 2003; Henggeler et al., 1998). Though the processes by which these interventions are intended to impact on offending are not made explicitly clear nor understood, nevertheless, evaluations suggest that MST interventions are some of the most promising programmes aimed at reducing offending in serious young offenders (see, e.g., Curtis, Ronan, & Borduin, 2004; Farrington & Welsh, 2002; MacKenzie, 2006).

We can use these two examples to understand the limits of 'making do' within criminology. Despite a degree of achievement, the SCP approach has inherent problems for successful prevention. 'Good enough theory' is developed in an entirely reactionary manner, in response to research findings elsewhere and the changing needs of practice (Cornish & Clarke, 2008, p. 45; Smith & Clarke, 2012, p. 292).[2] From a practical perspective, it is easier and cheaper to measure and intervene in opportunities rather than individuals; however, it is not necessarily effective to do so. The combination of reactionary theory development and limitations inherent in the practical and technical aims of SCP leads to both theory and practice that focus too intently on opportunity.

> *"In many cases situational crime prevention knows little or nothing about the offenders whose activities it is trying to stop, reduce or disrupt. Under these circumstances the most effective measures may be those that credit the as yet unidentified offender with few qualities other than rationality"*
>
> (Cornish & Clarke, 2008, pp. 38-39).

In terms of crime prevention typologies (for a summary, see Pease, 2002), SCP only deals in primary prevention, and ignores the offender and situation elements (see, for example, Ekblom's crime prevention framework, 1994). In contrast to the SCP approach, however, a wealth of

[2] This is not to say that good theory should not address new hypotheses and challenges to theoretical assumptions thrown up in the process of tackling practical problems, in fact, as Popper (1983) tells us, good science relies on this (see also, Bouhana, 2013).

research from the psychological tradition in criminology shows that there are qualities of individuals (other than rationality) that relate strongly to their offending behaviour. Furthermore and crucially, an *integrative* criminological approach results in recent empirical research findings demonstrating that the important characteristics of individuals influence offending behaviour *in interaction* with the opportunities they encounter (e.g., Hirtenlehner & Hardie, 2016; Kroneberg et al., 2010; Pauwels, 2011; Svensson & Pauwels, 2010; Wikström, 2009, 2014; Wikström et al., 2010; Wikström, Mann, et al., 2018, in press; Wikström, Oberwittler, et al., 2012). Although SCP is relatively cheap, its continued reliance on a strictly parsimonious, supposedly 'good enough', theory in order to retain its practical usefulness has entirely constrained its ability to take account of individual differences; severely limiting its impact in the 'bigger picture' of crime prevention. On a more philosophical level, we know that offenders and crime are actually rare and therefore it is arguably unnecessary to monopolise urban design with SCP technologies when we might prefer to tackle crime more strategically and instead design our urban spaces with other more convenient, wholesome, palatable, inclusive and more broadly relevant motivations in mind.

Although the theoretical roots of MST emphasise the link between individuals and their various environments, they do not fully address specifically how this works because developments were largely reliant on findings from studies that take a risk factor (prediction) approach and do not explicate mechanisms. MST aims to have impact on many features and aspects of individuals' lives and environments, and is therefore costly (in both time and money). These resources could be better targeted, and the potential for unknown negative effects reduced, if knowledge about the causes of crime was applied. Impressive cost-benefit analyses suggesting that MST saves $4.40 dollars for every dollar spent (Lee et al., 2012) could just be the tip of the iceberg for cost effective crime reduction interventions if they were better targeted to the specific integrative and interacting causes of crime and not just key risk factors.

12.2: Questionnaire items and wording

Table 24: Moral rules scale questionnaire items

I would now like to ask you about a number of things that a young person of your age may get up to. I would like you to tell me how serious you think it is for someone of your age to do the following?
Do you think it is very wrong, wrong, a little wrong or not wrong at all to…

	Very wrong	Wrong	A little wrong	Not wrong at all
Ride a bike through red light	□	□	□	□
Skip doing homework for school	□	□	□	□
Skip school without an excuse	□	□	□	□
Lie, disobey or talk back to teachers	□	□	□	□
Go skateboarding in a place where skateboarding is not allowed	□	□	□	□
Tease a classmate because of the way he or she dresses	□	□	□	□
Smoke cigarettes	□	□	□	□
Get drunk with friends on a Friday evening	□	□	□	□
Hit another child who makes a rude comment	□	□	□	□
Steal a pencil from a classmate	□	□	□	□
Paint graffiti on a house wall	□	□	□	□
Smash a street light for fun	□	□	□	□
Smoke cannabis	□	□	□	□
Steal a CD from a shop	□	□	□	□
Break into or try to break into a building to steal something	□	□	□	□
Use a weapon or force to get money or things from another child	□	□	□	□

Table 25: (Poor) ability to exercise self-control scale questionnaire items

Do you agree with the following statements about yourself? *0 = Strongly disagree, 1 = Disagree, 2 = Agree, 3 = Strongly agree*
1. I never think about what will happen to me in the future
2. I don't devote much thought and effort preparing for the future
3. Sometimes I will take a risk just for the fun of it
4. I sometimes find it exciting to do things that may be dangerous
5. When I am really angry, other people better stay away from me
6. I lose my temper pretty easily
7. I often act on the spur of the moment without stopping to think
8. I often try to avoid things I know will be difficult

Table 26: (Poor) parental knowledge scale questionnaire items

33. *When you are out by yourself or with friends, do your parents (or step-parents) usually know **where you are** (for example, at a friend's house or on a playing field)?*

- ☐ Yes, always
- ☐ Yes, most of the time
- ☐ Yes, sometimes
- ☐ No, never

34. *When you are out by yourself or with friends, do your parents (or step-parents) usually know **what you are doing** (for example, going to a cinema or playing sports)?*

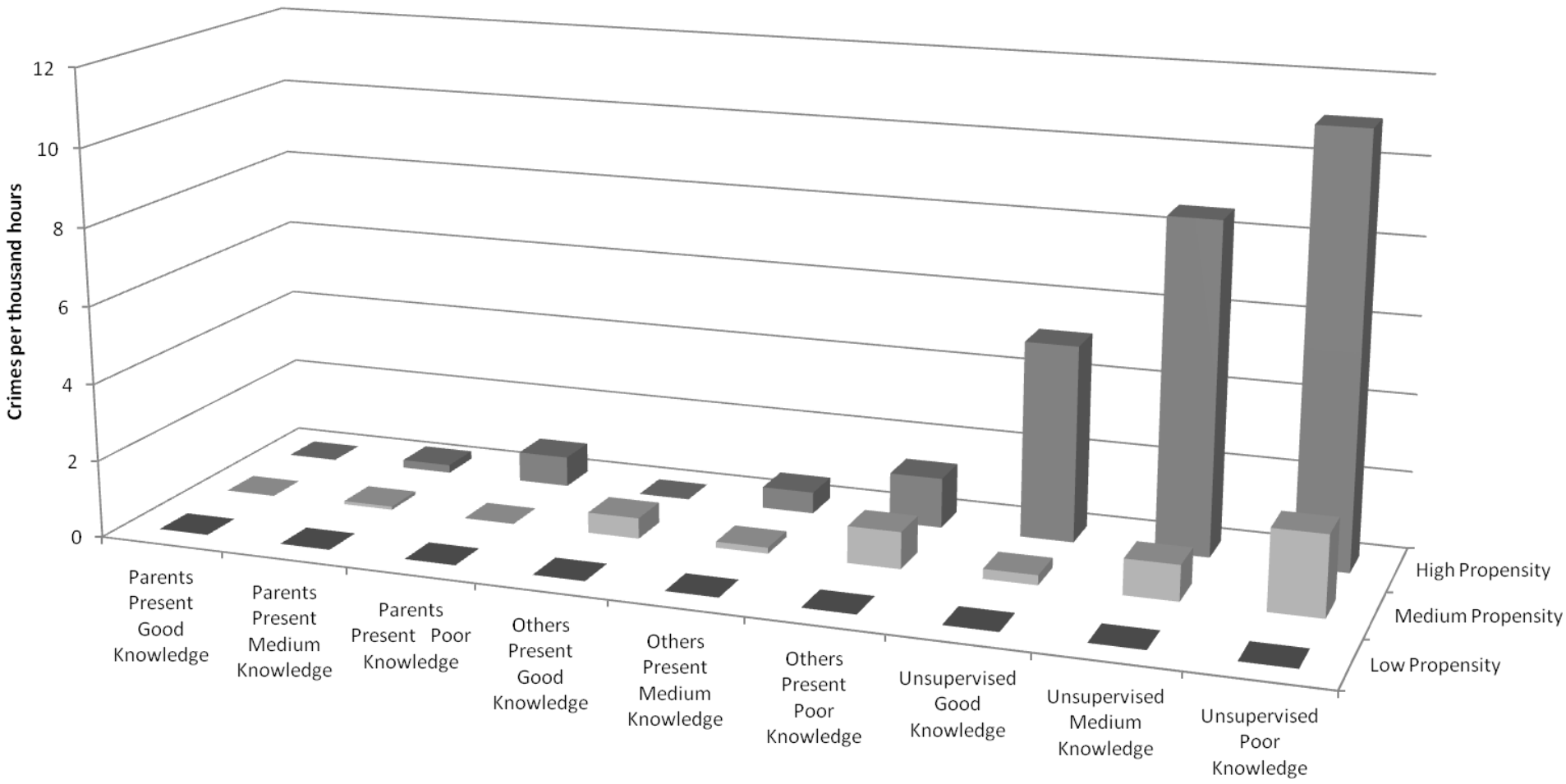
- ☐ Yes, always
- ☐ Yes, most of the time
- ☐ Yes, sometimes
- ☐ No, never

35. *When you are out with friends, do your parents (or step-parents) usually know **which friends you are hanging out with**?*

- ☐ Yes, always
- ☐ Yes, most of the time
- ☐ Yes, sometimes
- ☐ No, never

12.3: Additional crime rate comparison graph (27 groups)

Figure 20: Crimes per thousand hours by guardian status, perceived parental knowledge and crime propensity



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